SCOTTISH JOURNAL
OF
POLITICAL ECONOMY
FEBRUARY 1955

THE PRESENT COMPLEXITY OF WAGE PAYMENTS[1]

I

THE purpose of this article is to draw attention to the large number of different types of payment that are generally included under that convenient shorthand term—' the wage '. There has been in recent years some confusion—and not a little despair—evident in the attitude of economists to wages problems. It is the contention here that much of this is due to the lack of a clear decision on what it is that is being talked about: what is a wage and from what types of payment is it built up?

The approach diverges from the conventional in three ways. First, stress is laid primarily on differentials and the picture is close and detailed. It is more concerned with the short period than with long-run effects or long-run equilibrium. Secondly, more importance than has recently been fashionable has been accorded to the pattern of wages as it appears at the factory level, rather than in the broad sweep of industry. Thirdly, though the economist has generally been brought up to do most of his reasoning on wages in terms of time rates, here other forms of payment are given a much heavier weighting than has been customary.

II

THE COMPLEXITY OF WAGE PAYMENTS

Three points at which the wage overlaps with other sources of income must first be cleared up.

First, ' wages ' and ' earned income ' must be distinguished. ' Earned income ' denotes a group of payments wider than ' wages ' since it includes the fees and earnings of self-employed persons, which, though

[1]A version of this article was read to a Study Group of the Manchester Statistical Society in March, 1954.

income from work, are not 'wages'. Moreover, a person's 'earned income' has a longer time-reference than his 'wages' and may include 'wages' from more than one employment. For example, a man's earned income over a year might cover several changes of job, and periods in which he had more than one job at the same time, while 'wage' can normally be applied only to the proceeds of one employment, and is generally reckoned for a shorter period.

Secondly, a distinction can be made between 'wages' and 'salaries'. It appears to be largely an unfortunate accident that the term 'wages' should be used to cover all payments to employees, in which case it includes salaries, and that this same general term should be contracted in its scope also to denote the larger segment—those who work with their hands, who are 'works' rather than 'staff' whose pay is reckoned by the week or the hour rather than by the month, or who represent direct as against indirect or overhead labour cost to the employer. It seems probable that this distinction between 'wages' and 'salaries' is over-stressed, particularly since it results in a concentration of attention on it to the neglect of other important distinctions within the worker's pay packet. Here 'wage' is generally used to refer to the narrow grouping only.

Thirdly, there is a distinction between monetary and non-monetary payments. Some advantages of a job are not represented by money and are difficult to reckon in money terms, while others, such as pension benefit, or paid holidays, are represented in money terms but are not reckoned as part of 'the wage'. These 'fringe benefits' or 'net advantages' constitute differences between man and man in the labour market and may be important factors in deciding between jobs. They are not generally reckoned in the pay packet, however, and are excluded here.

The distinctions to be dealt with here are those between wage rates and other payments included in the pay packet of the wage-earner.

The first major section of the pay packet is the wage rate. Such rates may be considered under two headings, negotiated or agreed rates applicable nationally or to districts, and rates actually paid locally at factory level.

Conferences of employers' associations and trade unions, or meetings of councils with both sides represented, are practically universal in all industries in Britain. Meetings of this kind—after due bickering—generally produce a national rate for their industry or at least a scheme of district rates. The actual forms taken by the agreed rate, however, differ widely. In some cases rates are prescribed which are to be national standard rates and which specify occupational

categories. In other cases, minimum rates only are given, sometimes for occupations and sometimes for the industry as a whole. Occasionally the wage fixed is only a guaranteed minimum, which is in no sense thought of as a wage which will be normally payable in the industry but is regarded rather as a 'support price' against disaster. In predominantly piecework or payment by results industries, agreements may relate to an agreed price list and the agreement may fix a percentage (plus or minus) of the prices indicated in the list; this percentage may properly be referred to as the rate. In still other cases, the agreement may recommend an agreed minimum percentage above rates which should be reached by payment by results workers of average ability and training, or the agreement may fix special basic rates for payment by results workers.

These agreements of trade unions and employers' associations produce national or district rates, which form the basis for the complex of payments made to individual workers; and, varied in character as they are, these rates form the data on which most judgments on the movements of wage rates are made. In fact, however, the wage rate which is applicable to an individual worker in a specific factory may be supplemented by any one of a number of possible additional forms of rate payment. Not all factories adhere to the standard negotiated rates where these exist. It is rare for the negotiated rates to cover all possible occupational variations, so that locally agreed variations become necessary to cope with the occupational range within a factory. Moreover, where only minimum rates are prescribed, each factory will require to make its own determination of the actual rate payable, and in some cases this may mean erecting a complete wage structure of rates for occupations on top of one single prescribed minimum. The management may be able to exercise considerable freedom from union control in such internal arrangements.

The additional rates added at factory level, even in the cases where the least adjustment is required and the negotiated rates are 'standard', may take several different forms, some of which may be listed. A common reason for upward adjustment above the standard rate by an individual factory is that of competition for labour within the area, which compels individual employers to take steps to hold their labour force. It may also happen that a factory is in the habit of paying merit rate increments and, less frequently, increments based on length of service, and it is certainly common to pay additional rates to some individuals, below foreman level, as leading hands, bench leaders or charge hands. Then, too, many individuals will have higher rates because their type of work precludes their making bonus earnings

(because, for example, they are toolroom workers or maintenance workers); and, finally, it is not unknown for firms to extract the more certain portion of bonus earnings (say 20 per cent. when the normal average is 80 per cent.) from the bonus and add it in as a rate, or even to give an incentive rate which mounts with percentage increases in bonus earnings.

All types of payment in this motley collection are correctly labelled 'the wage rate' by the employee, since all form that part of his pay packet which is fixed and dependent for its payment only on his appearance on duty at certain set times. In reckoning future expenditure, 'the wage rate' is the amount that can be counted on as regular and secure as long as the job lasts and wage cuts are resisted. In contrast, the other major section of the pay packet—earnings additional to the rate—is subject to considerable fluctuation and uncertainty, and cannot be regarded by either employee or employer as an amount which has been contracted for *ab initio*.

The components of earnings are much more varied than even the possible combinations that go to make up the wage rate. After the worker has completed a standard week's work and received a wage rate, which will probably be larger than that negotiated nationally for his trade, he will normally expect some additional earnings of varying amounts. Again it is not possible here to give all the forms that these may take, but some may be cited.

First, the individual worker may be involved in some form of payment by results scheme. While it is probably not much of an exaggeration to say that there are almost as many variants of these schemes as there are factories applying them, they fall into three main groups—individual bonus schemes (where the worker is assessed for payment on the basis of his own output), group or pool bonus schemes (where the group is assessed and the proceeds divided), and indirect bonus schemes, factory average bonus schemes, and lieu work payments[2] (where the contribution of workers cannot be readily assessed).

Secondly, earnings may include large elements of overtime payments. Such payments are in a sense related to 'the rate' since they are based on different fractions of the rate payable for normal time ('time and a half' etc.), but the rate used for these calculations may frequently differ from the rate paid for normal hours. In some labour areas the prospect of considerable overtime may be offered as an alternative to high wage rates as an inducement to labour to join the

[2] *I.e.* payments made to workers in lieu of payment by results (generally because of a difficulty in assessing their output accurately).

firm. Here overtime is used as an implied starting rate rather than as a chance payment for possible extra hours.

Finally, earnings may include an assortment of special payments payable for specific types of work or special responsibility. Some of these special payments will be centrally negotiated and some will be purely local arrangements. Examples of this are the special payments for dirty or dangerous work, for responsibility involved in taking on extra supervision or assistants, for work at awkward hours or during the night, and so on.

Thus, the wage packet of the group known as wage-earners may include a variety of different types of payment: national and local rates of various types, payment by results, overtime and special payments. A summary of some of the points arising immediately out of this may now be given.

1. A general definition of 'wages' is unlikely to be of very much use. For detailed analysis of any kind there is not, and cannot be, any one acceptable and universal definition of a wage. Instead, there are a number of different payments to labour with distinct characteristics. It is not necessary to deny the use of 'wage' as a loose descriptive term, but it is necessary to be aware that it is that and no more.

2. The rôle of the trade union in the settlement of wages, at least at the national level where the trade union's thought is most conscious and the public most aware of it, is seen to be confined mainly to the prescription of and adjustment of basic wage rates, while the actual pay packet contains many other payments. In general, analysis in terms of trade union attitudes applies much more readily to starting rates than to actual amounts paid.

3. The union's share in the settlement of wages beyond the national rates will be exerted much more by local or district officers, and even by shop steward groups, than by the central body. In fact, there is a considerable divergence in the extent to which these different payments will reflect union influence. For example, factory wage rates will probably be a matter for the company and the local union organiser, or perhaps the shop steward's committee, while piecework prices will be fixed in the first instance by the employer alone, with the shop stewards holding a watching brief and the union organiser being consulted only in the event of trouble.

4. The various forms of payment have differing degrees of security attached to them, as regards both the certainty of their payment and the certainty of the amount payable. They range from payments which are certain to remain the same over periods of months to marginal additions which it is almost impossible to forecast reliably in advance.

5. These payments differ in the extent to which, and the way in which, they can be influenced by the employees' actions, other than the basic pre-requisite of coming to work. Some, for example, vary according to the amount of work actually performed (output), others vary according to the type of work, and others depend on some form of qualitative assessment.

6. As a corollary of the preceding points, the payments will differ in the extent to which they are capable of arbitrary and short notice alteration, and therefore the extent to which differences between factories and between departments within factories can imperceptibly appear.

III

Wage Complexity and the Employer

It may be argued that all these distinctions apply to wages in their relation to the wage-earner and that, considered from the viewpoint of the employer, the amount paid out to the employee is what is important, not its composition. The argument might run rather like this: ' Granted that there may be complexity in building up the wage payment, is it not nevertheless true that, for the employer, wages are the price of labour; and is not this " price " approach all that is necessary for the general currency of economics, which is then quite justified in dealing generally with the wage, considering only the total wage, or a representative indication of the total, without bothering about internal composition? '

A suggestion that it was not necessary for employers to worry greatly about complexities in wage payments appearing on the employees' side of the account would be wrong; these complexities affect the motivation of the wage-earner and hence the conditions of supply of labour, and the conditions of supply of his labour are very much the concern of the employer. Therefore, the different aspects of wages and of the supply of labour which are presented by different payment forms must occupy the attention of employers. While all these differences are based on the primary distinction between rates and earnings, this distinction can appear to the employer in several different ways, and these ways must now be considered.

1. *Fixed and Variable Costs in Wage Payments*

A very general way of putting the employer's problem is to think in terms of those parts of his labour costs which are fixed (relatively) and those which are variable. The approximate size and composition

of his labour force will be dictated, within broad limits, by his factory and plant lay-out, and in order to meet delivery dates the employer will have to determine how he can achieve maximum output while keeping labour cost as low as possible. To some extent, no doubt, he can recruit extra workers, but this will probably be limited by his existing plant lay-out and by the delay, cost and difficulty involved in obtaining extra plant. His most likely action will then be to look at the components of his wage cost, and to judge how to alter his wage payments in order to achieve maximum output. It is possible to see a clear division in the mind of the employer between those payments which he must regard as fixed, once he has determined the size and type of labour force required for his works, and those payments which he can vary to induce that labour to increase its production. In calculating labour cost per unit of output, for example, he will have one fixed total—the aggregate of the rates promised to his workers on employment—which must simply be divided by the number of units produced to give unit cost; and other payments, such as piece-work and overtime, which he may vary at will according to the urgency of demands for his products, and which will vary between units of output.

2. *Starting Rates and Actual Earnings*

The possible starting rates for the employer will generally be determined by two sets of circumstances: the agreements set out by national and local negotiations, and the labour supply conditions in the local labour market. He may well feel that the decision about starting rates is to an extent out of his hands, since it is at the point of determination of starting rates that the influence of trade union activity will be greatest. However, after the trade union and employers' associations have negotiated a rate, it frequently occurs that the starting rate acceptable in a local high wage area, or for workers in specially short supply, will be considerably in excess of that negotiated nationally, and management will have to adjust local rates accordingly.

Wage conditions necessary to induce job-seekers to undertake employment may include some suggestion at least that small amounts of overtime will be possible, and that some level of additional earnings is likely. The employer may find that the starting rate acceptable to his employees is already a complex payment which is determined partly by trade union agreement, and partly also by levels of wages locally payable and obligatory on the seeker after high quality labour. This latter circumstance may force him not only into

wage rates above the national but into delimiting to some extent, the broad pattern which his earnings payments will follow.

This promise about earnings must not, however, be thought to mean that starting rates *are* earnings levels. Only the vaguest of promises will be necessary,[3] and its fulfilment will be governed by a number of entrepreneurial decisions. The individual manager has before him an area of freedom of decision even though some vague lower boundary or approximate range has been postulated by his general hiring promises. The starting rates (including additional rates granted by the employer) are the price of labour at hiring, the conventional price for getting workers into an industry, and the ' wage ' which is the most general object of economists' comment. The earnings levels represent the total and average wage costs of the employer; and the gap between, or the area of freedom he is left, poses the problems of priorities he has to answer. Even though we qualify the existence of the gap by granting that some promises about additional earnings above rates are made or implied, the gap is still empty of specific wage methods and but sketchily defined. Managerial policy must ponder how best to fill it.

3. *The Emphasis on Workmen and the Emphasis on Effort*

One way of posing the managerial problem is to set the question how we define the unit commonly used in this type of discussion—labour. The most elementary point at issue here is whether we measure labour in multiples of workmen or in multiples of some abstract standard of effort or of results.[4] In fact, the probable answer is that at different times we want to use each of these different meanings of the word. In accordance with the grade of work being undertaken and with the grade of labour in question, management will attach varying degrees of urgency and importance to the necessity of keeping an unchanging labour force and to the simple output criterion. It will become appropriate to consider the methods of payment most suited to each.

If it is desired to keep the same workman for a long period—*i.e.*, if ' labour ' is to be interpreted as meaning ' men '—then wages must be adjusted to appear in the form which will buy men. A man

[3] The analysis of the Newhaven, Connecticut, labour market by Lloyd G. Reynolds (*Structure of Labor Markets*, New York, 1951) suggests that frequently the promises or presuppositions are falsified by the event.

[4] The use of the word ' effort ' is itself tricky since some can achieve equal results with less effort. We usually want to take account of results rather than the effort expended by diverse abilities. I suppose we are really using the unit of effort as exemplified by the hypothetical worker of average ability, and measuring the result appropriate to the effort of such average ability.

needs his wages to live. When he thinks in terms of his future, he begins to plan, and the chief need in planning is to have reliable data, especially on income. He will want to be assured that his wage packet will regularly contain an amount on which he can budget securely. This type of outlook will lead to the elevation of regularity as a chief testing point for wages. Such a man will prefer his pay to be of a fixed regular amount weekly, and this is the form of wage payment which will be most appropriate for the employer wishing to ' buy ' the long period services of a man.

Where payment is simply for effort or output of labour, the employer using any man without special preference, then a payment related to the effort, fluctuating as effort alters, will be appropriate to the employer's needs. The worker, too, will wish to feel that extra work has received extra payment, especially if he has little attachment to his employer and little security. Even then, however, the employer may find a simple output criterion difficult to operate, since the worker may be concerned to get a fairly regular weekly amount in his pay packet, in order to live at as high as possible a standard (set by the lowest amount to which his weekly wage is likely to fall). He may, therefore, attempt to manipulate his bonus earnings to give him about the same amounts in succeeding weeks. Nevertheless, the worker employed on short term will be likely to respond more readily to high earnings and output incentives and to be less concerned with regularity in the wage.

If these two different concepts of ' labour ' are set side by side, they will present the employer with the difficult task of reconciling ' security ' considerations with those of ' output '. This task will require him to adjust his wage payments in such a way that he can both secure the man he needs and maximise output.

4. *The Differential created by Skill*

An aspect of wage problems which must constantly be in the mind of management is the question of differential payments to skill, either inherent or acquired as a result of a training process. While wage theory tends to emphasise equality and equilibrium in the wage, with a ' rent of scarce ability ' approach to skill and training, the manager's problem is largely one of differences in wages to match the differences in skill, quality and type which appear in the numbers of diverse occupations making up his labour force. The manager will require to organise his ladder of payments so that he preserves the occupational and social status of the skilled groups, and creates a wage differential adequate to attract suitable labour to the necessary categories. Such

skilled groups will be formed by the occupational structure of the general labour market, and further divided into some highly specialised categories by the particular requirements of the works in question. In its most highly developed state, skill may become synonymous with indispensability and with ' key man ' status, and this makes the management's problem still more difficult.

5. *The Wage as Incentive*

The functions of the various types of payments may also be phrased in terms of ' incentives '. To the worker, the wage structure will be successful if it provides for the different aspects of his work which he considers should be specifically rewarded, and if it provides for his income needs in the most appropriate way. These job advantages to the worker are normally incentives in the eyes of the employer, who wishes to direct the efforts of his labour force in the most appropriate directions. This parallelism of incentives from the employer's side and of rewards from the worker's point of view means that in a good wages structure an employer will align the incentives in the way which is most appreciated by the workers and which is productive of the maximum effect or of the desired combination of effects.

The types of incentive may be listed:

(i) The first is that towards increase of output. The employer will wish his workpeople to create the greatest possible output in the least possible time. It is unfortunate that the word ' incentive ' should have become synonymous in the popular mind with ' output ' schemes for this is not the only incentive the employer need consider. While the major part of the employer's efforts may be directed towards maximising output, in manipulating the labour force to achieve this, he also requires to take account of other characteristics and other incentives.

(ii) The wage structure must provide an incentive to the worker to stay where he is. This falls into two parts:

(*a*) The general wage level must be adequate to stave off competition from other prospective employers. The factory must ' keep in step '.

(*b*) The wage structure must be designed to permit the good employee to regard his work as a career. It must therefore provide stability and certainty.

(iii) There must be an incentive to skill. The wage structure must be such as to make workers feel it worth while to acquire and exercise skill, both to secure an enhanced money reward and to have the status which this skill and income give. This applies generally and to special

grades of skill. The wage must be enough to attract new apprentices and to instil pride in craftsmanship.

(iv) There must be some incentive to quality, or penalty for bad quality. The wage structure must be such that it does not encourage shoddy workmanship.[5]

(v) There must be an incentive to take on and stick at unpleasant dangerous or dirty jobs.

All these differing incentives require differing combinations of high time rates, bonus schemes, differential payments for special skills, and additional payments for particular characteristics, either of quality in the product or of special difficulties or unpleasantness in the work.

Section III may now be summed up.

1. It is not permissible to assume that the wage viewed from the employers' angle presents a homogeneous total, the constituents of which he need not analyse. There are numerous and different constituents of the wage affecting the composition of his labour force and its output, and these he ought to study.

2. The employer has to take note especially of the different motives which inspire labour to embark upon alternative methods of enhancing its wage, and the consequent differing incentives which management may apply.

3. As a corollary of the existence of many different schemes of payment and of purposes within a single wage structure, it follows that the problem confronting the management will invariably be complex and confused. There will be a constant danger of successfully dealing with one aspect of the matter only to upset another: this will be especially true if management is not fully aware of the number of variables involved.

4. The ways in which wage cost will bear on the entrepreneurial decision will differ, since they may be affected by the composition of the wage packet.

IV

Wage Complexity and the Employee

This discussion of the wage problems which face the employer has inevitably led to reflections about the reaction of employees to wage payments of different types. The two major points may conveniently be summarised.

[5] It may be said that this is purely a matter of providing a deterrent by means of inspection of output. It seems to me to be regrettable if a modern wage structure cannot encourage high quality and concentrates on minimum rather than optimum standards.

1. The distinction in types of wage payment appropriate to the employer making the choice between buying a worker or work was based largely on the search for security as a motive in employment for the wage-earner.[6] The strength of this motive will naturally vary from individual to individual, but it will depend to a considerable extent on whether the job available or the training of the man concerned permits a larger horizon to his plans, and makes him aware of and prepared to plan for the future. A skilled tradesman in employment of other than an obviously temporary nature will probably be particularly prone to develop security as a conscious motive. Income security implies that the workman will want to be able to budget for the future on the basis of his pay and to rely on a certain minimum level of earnings. In a sense, he will want to maximise the minimum level of his pay packet[7] rather than to aim at specially high and fluctuating earnings. Since, in effect, he is looking for a salary, much of his outlook and social orientation will be similar to that attributed to the salary-earner. In general, this type of outlook will go with job-security (the case where the employer is buying workers), but it is probable that income-security—a levelling out of weekly fluctuations in the pay packet—is a fairly common ideal even among those whose work is the employers' only interest. In fact, the best possible payment for a worker may be one which is influenced by his earnings capacity and pushed up to a high level by his extra effort but yet remains relatively stable from week to week without those fluctuations which disturb his plans.

2. The patterns of expenditure which arise from employees' incomes obtained under different methods of payment will differ and will reflect the different purposes to which 'regular' and 'windfall' payments may be devoted. The incentive to work may alter according to whether the payment expected is of the windfall or regular variety, since the purposes to which these different types of income may be devoted are by no means the same. The point may be put more simply by saying that the patterns of expenditure of two men both averaging

[6] Security may be thought of by the worker in three ways. First, he may want job security; if his work is of the type where the employer wants to feel sure of his services for a considerable period, then, short of major changes in trading conditions, the worker can have reasonable job security. Secondly, he may want security when he retires; the spread of pensions and the desire for them shows this to be regularly the object of attention by workers' organisations. Thirdly, he may want a secure income on which to budget. It is this third type that is at issue here.

[7] The persistence of workers in attempts to raise basic rates even though earnings may be considerably greater owes much to this type of attitude.

£10 a week will differ if one has a regular wage of £8 and £2 extra earnings and the other has £5 regularly and averages another £5 in extra and uncertain earnings. The regular weekly amount is of greater long-term use in expenditure since it permits the undertaking of items (house rent, hire purchase, etc.) which will require regular upkeep, while the more casual payment may only be valuable for once-for-all expenditure. In effect, the ingredients of the basic standard of living of the worker are dependent on his regular wage, while extra windfall earnings are available only for the 'frills' of his life. It is therefore likely that the worker may be more casual, less predictable and less to be depended upon where the remuneration is of the windfall type, since he may feel that the expenditures he contemplates with extra earnings are less urgent and more easily put off than those involved in the budgeting of his basic wage.[8]

The dockers provide an excellent example of the contrasting attitude of workers to regular and irregular income payments. On the whole, dockers are workers with high average earnings but low social status. This may be attributed to the system by which they are paid, which gives them only a small guaranteed and regular payment and a large volume of additional earnings, subject to frequent violent fluctuations. The docker can only contract a fairly low level of regular outlays—his basic standard of life—and will tend to treat a large proportion of his pay as 'found' money which can be expended lavishly on less worthwhile objects.[9]

V

Wage Complexity and Wage Statistics

There is a strong indication in the foregoing that information is required on the wages structure of factories, since it is here that the apparent national uniformity breaks down. It may well be that the main problems raised by wages in the factory are worthy of socio-

[8] James S. Duesenberry (*Income, Saving and the Theory of Consumer Behaviour*, London, 1950) discusses the effects on consumption patterns of a rise to a higher income group. The differentiation of regular and irregular payments would show that the spending patterns which would result from a rise in the regular weekly payment would be different from those which would arise from an upward trend in irregular payments. The former would be likely to produce a slowly rising proportion of income spent on generally worthwhile schemes; the latter a much more rapid rise in less final and more transitory expenditures. The 'Duesenberry effect' is likely to differ with different systems of payment.

[9] A docker who lived in a slum property in a poorly housed area of Glasgow spent fifteen shillings whenever possible on going to and from football matches in a taxi.

logical rather than statistical analysis[10] but probably the statistical needs are primary.

The available statistics of wages in this country are well enough known and there is no need here to present a detailed survey. While any attempt to list their broad characteristics is difficult, the following five points may be valid.

1. Statistical analysis of wage rates has mainly referred to nationally agreed rates. There has been little attempt to build up a systematic account of local practices in wage rate arrangements.

2. The term ' wage rate ' has been used to refer to a variety of types of rate payment, and index numbers of wage rates have not universally referred to the same type of rate.

3. Earnings enquiries, with the exception of the 1906 Enquiry, some by the nationalised industries and some by unofficial agencies, have not dealt with occupational earnings or even with the earnings of the broad occupational grades of skilled, semi-skilled and unskilled.

4. Regional differences and differences caused by different methods of payment have also been largely neglected. While hours of work have been given, and hence hourly earnings, the ' overtime component ' has not been isolated, and it has generally not been possible to calculate average earnings in a standard week.

5. The information provided has usually been on an industry basis. It has therefore been too all-embracing to permit of the filling in of the details of the components of the totals and has not allowed understanding of the particular confusions and difficulties of wage patterns experienced at the factory level. No studies devoted to the wage patterns and problems of factories have been provided by official agencies.

Judged on the basis of the limitations which this suggests, our present knowledge is likely to cause us to think about wages largely in broad terms and about national issues.[11] So long as this is so, our

[10]Applied research into the subjects discussed here might take several forms. For example, if, in fact, the influence of trade unions on the actual wage set-up, as it is found in the factory, is felt more through the activities of the local organiser and the shop stewards or their equivalent, then it seems probable that greater emphasis in trade union studies should be laid on the local and shop steward levels and their relations with managerial bodies. There is, too, undoubtedly a case to be made out for sociological studies of the status of workers, of their motivation and response to incentives, and also for investigations into the background of managerial decision-making on factory wage policy, and the working out of these decisions.

[11]A generation reared on material presenting the overall movements of wage rates and earnings considered at the national level may tend to accept the idea of national uniformity and to regard national movements as of the highest importance. The breaking down of national averages to show their components, while thought of primarily as an attempt to provide greater information, may itself correct the bias towards thinking only in national terms.

understanding of wages problems at local level will be limited. The task of correction falls into two sections.[12]

First, in order to understand more fully the variations in wages resulting from differences in occupations, regions and types of payments, detailed analysis of average earnings in individual industries is required.

Secondly, statistics on the workings of the wage structure of factories are required. This information should be designed to show the components of the pay packet, the fluctuations in the earnings and hours of individual workers, the variations in earnings of different categories of workers and of workers paid by different systems of remuneration, and the distribution of earnings within the work-groups.

VI

Conclusion: Some Theoretical Implications

While the principal object of this study has been to emphasise the present situation in regard to method of payment and to examine its effect on the position of the participants, the employer and the employee, it may not be inappropriate in this concluding section to show its bearing on theoretical problems. No more than a brief series of what appear to be the important points is attempted.

1. The usual theoretical approach to employers' demand for labour states that the wage is the price of labour and that the price paid will be equal to the marginal net product of labour. It is undeniably true that the total amount paid out in wages represents the cost of the labour to the employer, but it is here suggested that 'marginal net product' has different meanings according to the type of labour required (that, for example, work may mean the services of labour for a long period as well as output), and that the way in which the total wage payment is made will result in different types of incentive to the labour, and in different types of 'product' to the employer. Differences in the composition of the total wage payment result in different 'labour products' to the employer and should reflect his requirements in building up a labour force. This could be put another way: the theory postulates that equal amounts of wages will bring out equal amounts of marginal net products, whereas the analysis here suggests that different ways of paying wages or different compositions of the wage packet will result in 'products' which will

[12] This task will probably finally fall on the purveyors of official statistics, but at present it is a matter for private enterprise.

be dissimilar and difficult to compare and may possibly defy reduction to equality.

2. The bias of the theory is towards expressing ideas in terms of an equilibrium wage. In practice, difference between wages is more meaningful than equality. More attention is given to the adjustment of a series of wage levels than to one equilibrium wage level. The importance of wage complexity lies to a great extent in its effect of obscuring these levels.

3. The motive of the wage-earner in accepting work, or in calculating the wage against the work required, will alter according to the type of wage payment in question. In particular, the motives which govern his attitude to the basic wage or starting rate differ from those which dictate his attitude to variable earnings. The supply of labour may differ according to the way of paying its price.

4. Theories dealing with consumption patterns and changes in consumption usually relate these to income changes. In such theories wage income is generally treated as a homogeneous quantity. It is here suggested that the way in which different parts of the total wage income are paid will affect the resultant pattern of consumption and the way in which alterations in wages affect consumption.

5. It has become a commonplace to say that there is little point in analysis of the circumstances attached to the individual wage bargain, since wages are now settled for large groups at a time in an atmosphere determined by the attitudes and beliefs of trade unions and their counterparts among the employers. The comments of this study on this attitude may be put in two slightly different ways. First, wage payments can be divided into union-negotiated wage rates and an assortment of other payments. These latter are more variable and less predictable than the wage rate, and the union influence on them may be slight. There is frequently a gap between the negotiated arrangements, where the unions exercise control, and actual earnings levels, and this gap may be sufficiently large to give considerable freedom of action to the employer. There are several different kinds of payment in the pay packet, and the union's influence is by no means equally distributed over them. Secondly, the tendency to assume that the trade union is determining the supply of labour, and uses its monopoly position to decide on the wage level, may be correct only in regard to wage rate levels. If the wage level refers to the total or average of all wage payments, then the influence of the unions is much less dominant. There may be much more scope for variation, and for the working out of economic rather than institutional forces.

Glasgow D. J. ROBERTSON

THE AMERICAN ORIGINS OF A SCOTTISH INDUSTRY[1]

In the first week of January 1856 the American merchantman *Harmonia* sailed up the Clyde and dropped anchor in the port of Glasgow. While it is probable that the vessel had made the journey across the Atlantic many times before, it is unlikely that it had carried a similar cargo, for on this occasion it brought the necessary machinery and fixtures, together with a nucleus of skilled American workers, to found Scotland's first vulcanised-rubber manufactory.

Here it is proposed to describe the circumstances surrounding this transference of skill and technique from the New World to the Old.

In the United States attempts had been made to imitate the crude native-manufactured shoes imported from South America since the earliest days of the century, but the growth of the industry and its extension to clothing and mechanical goods (the latter being the employment of rubber with machinery) waited upon the quickening of the American economy in the 1830s. In these years several rubber factories appeared along the waterfalls of the eastern seaboard,[2] but owing to the downward trend of business conditions in 1837, and more particularly to the immature technique practised in those days, many of these establishments were subsequently abandoned and did not reappear until the early forties. The chief imperfections of the uncured rubber prior to that date—its tendency to soften in the heat and harden in the cold, its tackiness, unpleasant smell and perishable nature—had been largely overcome by the sulphur-heat vulcanisation process discovered by an American, Charles Goodyear, in 1839. The importance of this discovery is that by combining rubber with sulphur and lead at a high temperature Goodyear imparted to rubber a durable quality which it had not hitherto possessed. With the discovery of 'elastic metal' rubber manufacture could be extended to mechanical

[1] My thanks are due to The North British Rubber Company Ltd. of Edinburgh for placing their early records at my disposal; to Mr. Walter H. Norton of the United States Rubber Corporation; Mr. R. Ginger of Harvard University; Mr. D. A. Sinclair, Curator of Special Collections, Rutgers University; Mr. H. J. Dubester, the Library of Congress; Mr. H. C. Pritchard, the University of Illinois Library; and to Henry Lee Norris of New York City. I have received financial assistance from the Houblon-Norman and Fulbright Committees. The manuscript references are to The North British Papers.

[2] The first American rubber factories were at Northampton, Springfield, Framingham, Roxbury, Boston, Woburn, Salem, Lynn, Easton, in Massachusetts; Providence in Rhode Island; Naugatuck and New Haven in Connecticut; Troy and Harlem in New York; and New Brunswick in New Jersey. See C. Goodyear, *Gum Elastic* (New Haven, 1855).

devices of every kind and, at a later date, to the production of hard and pneumatic tyres.

In the United Kingdom at this time, as in the United States, the industry was still in its infancy. A patent for waterproofing cloth by spreading it with rubber had been taken out by Samuel Peal in 1791. In the South of England Thomas Hancock[3] had begun to work up rubber articles, while in Scotland waterproofing of garments had been advanced by Charles Macintosh.[4] Some years before Charles Goodyear's discovery of vulcanisation in 1839 there had been a consolidation of the Hancock-Macintosh forces with certain textile interests in the Manchester area, trading under the name of Chas Macintosh and Company. Finding it difficult to bring home the significance of his vulcanisation invention to American capitalists, and with little money to continue his experiments, Charles Goodyear turned to this British rubber group in an attempt to negotiate the sale of his discovery for £50,000. In August 1842 his agent arrived in England armed with the first samples of American 'improved rubber'.[5]

Whether the English inventor Thomas Hancock made his subsequent discovery of the vulcanisation process independently of the Goodyear samples delivered to the Manchester company in 1842 is difficult to determine. Most relevant here is the fact that Hancock entered his own Patent Specification for the vulcanisation process on 21st November 1843, eight weeks before Charles Goodyear belatedly applied for his English patent, on 30th January 1844. When the first important consignments of American footwear—made under the Goodyear patent—appeared on the British market in 1847 the English rubber combine was in a position to test at law the rights of Goodyear's licencees to sell their products in the United Kingdom.

The outcome of this litigation was an arrangement between Chas. Macintosh and Company and the Hayward Rubber Company of Colchester, Connecticut, whereby, in consideration of a royalty paid to the English company, the American manufacturer was granted the sole right of selling his rubber footwear in the British market. Why Hancock and his partners did not provide these goods themselves might be explained by the initial inertia shown by the British in contrast to the attitude of the American manufacturer in this particular

[3] The story of his life's work is told in his *Personal Narrative* (London, 1857).

[4] His patent covering the use of coal-tar oil as a solvent for rubber, and the manufacture of double-texture garments, was granted on 14th June 1823. See *Biographical Memoir* by his son George Macintosh (privately printed, 1847).

[5] See an article by the author, 'Origins of an Early English Rubber Manufactory', *Bulletin of Business History*, Vol. XXV, No. 1, March 1951.

field. A more direct reason, as Goodyear was to argue in the courts at a later date, might have been that in the absence of lead compounds declared to be a necessary ingredient in the Goodyear patent, it was not technically possible to make merchantable footwear by means of Hancock's specification.[6] Whatever the cause, there can be no denying the superiority of the American products, and Hancock's belief that he could limit the supply of American overshoes to those manufactured by the Hayward Company was incredible. On both sides of the Atlantic there was a growing number of people interested in the sale of American rubber products of all kinds, and no sooner was the agreement between the Hayward and the Macintosh companies made known than the British and American manufacturers and dealers set themselves to undo it.[7] In fact Hancock was unable to restrict the American trade to the Hayward Company, and was left to lament, strangely enough, in an age of individualism, ' the competition which followed '.[8]

The legal contests to which the Hancock and Goodyear patents gave rise continued throughout the years 1847-56 and are too detailed to enter into here.[9] It will suffice to say that after several unsuccessful attempts to unseat Hancock, or to bring about a compromise between the American and British rubber interests, the trade decided to submit his patent to the most exhaustive test of legality known to English law, namely to issue a writ of *scire facias*. It was in the action Queen v. Hancock,[10] which was heard in the Court of Queen's Bench in June 1855, that Charles Goodyear made his last unsuccessful attempt to regain from Hancock what he considered to be his own patent rights. Had Goodyear done so he would have been able to exact a royalty from every English rubber factory using the Hancock process.

The British courts having decided in Hancock's favour, there was nothing more Goodyear could do except hasten to France and try to salvage what remained of his patent rights there. His own countrymen, however, were evidently of a different mind. In fact one of the most interesting sequels to the long course of litigation in England was the founding of an American rubber manufactory in Scotland simul-

[6] Whereas Hancock considered that sulphur alone combined with the rubber and, subjected to a certain degree of heat, was sufficient for vulcanisation to take place, Goodyear included salts of lead, which accelerated the change and made it possible at lower temperatures.

[7] See the report contained in the London *Times* of 4th November 1848.

[8] Hancock, *op. cit.*, p. 142.

[9] Hancock v. Somervell and Burr, Newton's *London Journal* (1847), Vol. XXXIX, p. 158 *et seq.* Hancock v. Moulton, *Mechanics Magazine* (1852), Vol. LVI, Nos. 1504-6, pp. 456-7 and 491-2. Hancock v. Ross and others, *Mechanics Magazine* (1854), Vol. LXI, p. 37 *et seq.*

[10] *Mechanics Magazine* (1885), Vol. LXIII, p. 80.

taneously with Hancock's triumph over Goodyear. The former had barely time to congratulate himself on the outcome of his struggle with the Americans before the *Harmonia* appeared off the mouth of the Clyde. Hancock's delay at the outset in protecting his discovery of the vulcanisation process in Scotland (in this instance, curiously enough, Goodyear's Scotch patent preceded Hancock's)[11] had revealed to American rubber interests a weakness which they were quick to exploit.

According to the Articles and Memorandum of Association the capital ($102,157.76) of this venture, which in 1856 became The North British Rubber Company, was subscribed by the partners of one of the oldest branches of the American rubber industry,[12] J. R. Ford and

Patents	Dated	Specification enrolled
[11] Hancock's English patent	21st November 1843	21st May 1844
Newton's (Goodyear's) English patent	20th January 1844	30th July 1844
Newton's (Goodyear's) Scotch patent	12th March 1844	11th September 1844
Hancock's Scotch patent	25th June 1844	19th October 1844.

The stages by which The North British Company was able to make use of Goodyear's Scottish patent can be traced through the following Indentures in the company's possession: Indenture dated 2nd November 1852, between Newton and Goodyear, whereby Goodyear obtained full rights over the Scottish vulcanisation patent; Indenture dated 4th August 1856, between Goodyear and Judson, which transferred these rights to the latter, who, on 9th August 1856, vested them in the Directors of The North British Company. It is also worth recording that the original plant of the neighbouring Scottish Vulcanite Company, formed at Edinburgh in 1861, had also been operated in the United States until an adverse decision in a patent suit resulted in its transference to the Scottish capital.

[12] The first company organised for rubber manufacture in the United States was the Roxbury India Rubber Company of Roxbury, Mass., chartered on 11th February 1833. The origins of the New Brunswick branch can be traced to the early experiments in rubber-footwear manufacture carried out by Horace H. Day and Christopher Meyer in the late thirties. During the following decade three important New Brunswick rubber corporations were formed: The Newark India Rubber Company (1843), J. R. Ford and Company (1844), and Onderdonk and Letson (1846). By the seventies these businesses had been merged along with others into The Novelty Rubber Company, the New Jersey Company, the New Brunswick Company and the Meyer Company.

Company, of New Brunswick, New Jersey. Particulars of the principal subscribers are given below:

Shareholders	Amount contributed to North British capital	Business interest
James Bishop of New Jersey (1816-1895)	$25,539.44 (25%)	Shipping agent, merchant, and Congressman. Head of the shipping house of James Bishop and Co., New Brunswick and New York (founded by his father in the eighteenth century). He was the most influential associate of the rubber pioneers mentioned below. Bishop amassed a fortune of $20,000,000.
John R. Ford of New Jersey (1817-1896)	$25,539.44 (25%)	Dry goods merchant. Brother-in-law of James Bishop. It was due to the latter that Ford became a rubber manufacturer and later joined forces with Christopher Meyer in 1845. At the time of his death in 1896 he is reported to have been worth $15,000,000.
Christopher Meyer of New Jersey (1818-1888)	$25.539.44 (25%)	An ingenious mechanic. Gained his first acquaintance with rubber manufacture at the pioneering rubber mills of Newark, New Jersey. Financed by James Bishop, he was one of the very first to attempt rubber manufacture at New Brunswick in 1839. As an associate of J. R. Ford and James Bishop played a leading rôle in the New Brunswick rubber industry until shortly before his death in 1888. The only founder member of The North British Rubber Co. born outside the United States. His wealth at the time of his death was estimated at $13,000,000.
B. F. Breeden of New York (? -1873)	$15.323.66 (15%)	Sales manager and partner of of J. R. Ford and Company.
Spencer T. Parmelee of New York (1805-1875)	$10,215.78 (10%)	Until he joined forces with the Ford group had been employed as works manager of pioneering rubber mills at New Haven, Connecticut.

It is worth noting that a considerable part of the capital contributed by J. R. Ford, $13,306.59 out of $25,539.44, consisted of machinery shipped to Scotland from the Ford plant on the banks of the Raritan. Detailed records[13] exist which show that, with the exception of a vulcanising heater, a steam-engine for the power supply, and a number of shoe lasts purchased in Glasgow, the shipment from New Jersey included all the machinery and fixtures necessary to begin manufacture in Britain. The uniform design and the simple construction of the early British and American rubber machinery made it unnecessary for the Americans—once their plant was established in Edinburgh—to import additional equipment from the United States. Henceforth their requirements were met by a neighbouring Scottish firm of machinists[14] and by buying up the equipment of less fortunate English rubber companies who were being forced out of business. The Ford Company did not ship American rubber machinery across the Atlantic because it was superior to British designs—in fact the evidence points to the

[13] According to a list contained in the Bill of Lading, dated in New York on the 30th day of October 1855, the rubber machinery carried by the *Harmonia* was as follows:

2 Two Hhds Sundry Irons
2 Two Kegs Sundry Irons
53 Fifty-three Boxes Sundry Irons
25 Twenty-five Rolls for Machinery
24 Twenty-four Wheels for Machinery
2 Two Double Wheels for Machinery
26 Twenty-six Side Frames for Machinery
5 Five Pinions „ „
10 Ten Bed Plates „ „
3 Three Pillow Blocks „ „
2 Two Pedestals „ „
8 Eight Pulleys „ „
4 Four Shafts „ „
5 Five Packages of Bolts „ „
2 Two Packages Cast Off Forks for Machinery
3 Three Packages Pieces Cast Off Forks for Machinery
4 Four Screws for Machinery
5 Five pieces line Shafting for Machinery
4 Four level Hubs for Machinery
13 Thirteen Packages Oven track Bars for Machinery
1 One Package Bars for Cloth Winding Frame
1 One Holder for Callender
1 One Package of Levers

The detailed list of the 205 packages is still in the possession of The North British Rubber Company Ltd. The freight charge was fifty shillings per ton of 2,240 lb. gross, net of packages and contents. The total bill for transport from New York to Glasgow was £370. From the ship's side at Glasgow to the Castle Mills the freight charge on the railway averaged eleven shillings per ton inclusive.

[14] Jas. Bertram of Edinburgh.

contrary[15]—but because the choice facing Ford and his partners was either to employ it in making an attempt to win part of the growing British market for rubber products, or to allow the machinery, which at this time was superfluous to the needs of the New Brunswick group. to stand idle in New Jersey.[16] Added to this was the growing conviction on the part of these men that the British were not making the most of their opportunities in this new industry, and that the establishment of their own production and sales organisation in Europe offered the prospect of larger profits than either the extension of the New Brunswick manufacture or the future development of the export trade.

While it would be unwise to stress the rôle of one of these men to the exclusion of the others, the point is worth mentioning that the shipping agent James Bishop not only furnished a quarter of the capital required to finance the new company but also co-ordinated the venture in its earliest days. The transference of funds to Britain, the recruitment of workers, the shipping of crude rubber, equipment and supplies, in fact all the initial transactions required to establish the American branch of the industry in Scotland, were conducted by Bishop's organisation in New York,[17] and it continued to serve the Scottish company long after the original founders were dead. According to contemporary accounts it was Christopher Meyer who first thought of establishing a branch of the industry in Scotland, but he could not have

[15] In the case of the Moulton Company (footnote 5 above), established at Bradford-on-Avon in England in 1848, the combination of American technique (the machinery was built to American drawings and with the benefit of the accumulated experience of Moulton's American engineer Frost) and Staffordshire skill and Staffordshire pig iron produced 'a very fine sett of machinery' that was the envy of the Americans themselves. The New York rubber manufacturer William Rider, writing to his associate Stephen Moulton on 5th June 1850, said: 'Your machinery is so much better than ours in point of finish that we cannot come up to you in finishing the face of goods or the likeness of rubber put on—we shall be obliged to have some chilled Rolls from England for our machines here.' These were later delivered from the Bilston Foundry, Staffordshire.

[16] 'In 1857 [1855] Mr. C. Meyer planned a prodigious manufactory at Edinburgh, Scotland. He had stocked the buildings now occupied by the Novelty Rubber Company with machinery for which he had no use when the hard rubber works began operations there, and it occurred to him to utilise it by organising a foreign factory.' A. E. Gordon, *New Brunswick and its Industries* (New Brunswick, 1873), p. 51.

[17] While James Bishop's first account with the Scottish Company (covering the period 22nd October 1855 to 1st January 1857) is too detailed to set out here, it deserves comment. On the debtor side were listed the payments made on account of salaries, wages, counsel's fees, expenses of baggage and freight, insurance, rubber shipments (financed by 4-6 months' bills), and the drafts remitted by the Scottish undertaking to meet their current expenses. On 4th December 1855, 30th January, 24th May, 7th July, 4th October and 22nd December 1856, a number of drafts were remitted by Norris, amounting to more than £3,000. The rate of interest charged on these bills ranged from 8 to 10 per cent. The credit side of the account records the cash received from the partners of The North British Company. All transactions, other than the drafts mentioned above, were charged with interest at 7 per cent.

gone far with his idea without the co-operation of his partners Ford and Bishop.

The earliest papers of the Scottish undertaking deal with the preliminary arrangements made by Henry Lee Norris,[18] then a partner of James Bishop and Company, and one-time United States Consul in Para, who arrived in Glasgow in the winter of 1855.[19] Before establishing an American company in Scotland certain problems had to be settled. The most important of these concerned the supply and marketing situation, the legal problems bound up with Hancock's patent rights in Scotland and the alien status of an American company, and the finding of suitable manufacturing premises. Norris's letters show that on all these counts he was able to present a favourable report to his American associates. As regards accommodation, the original intention had been to establish a manufacturing centre in the heavily populated Glasgow area. In fact suitable premises were not available in that city and the American company secured possession of a block of buildings in Edinburgh known as the Castle Silk Mills,[20] initially on lease and later by an outright purchase for the low figure of £7,500. Newspaper reports of the sale state that the buildings were erected a few years previously at a cost of approximately £50,000. Possession was obtained on 1st February 1856. Meanwhile, almost a month earlier, a Scottish firm of lawyers had given a favourable opinion on Goodyear's patent rights in Scotland.[21]

> 'In reference to Hancock's Scotch Patent we are of the opinion, therefore, that there are two good objections to it. The first founded on the long interval which was allowed to elapse between the dates of his English and Scotch Patents and English and Scotch Specifications. And the second on the circumstance of Newton (for Mr. Goodyear) having anticipated in date Hancock's Scotch Patent and Specification by his own.'

The further question of alien status was one of some importance for:

> 'An alien, unless naturalised' (wrote Norris's legal adviser in 1855) 'cannot hold land or exercise political rights but he may hold leases and moveables.'

[18] Henry Lee Norris (1813-1881) was born at Salem, Massachusetts. Employed by the pioneer rubber company in the United States, the Roxbury India Rubber Co. of Massachusetts, in the thirties, he later went to Para as the agent of Bishop and Company to study the supply of crude rubber.

[19] According to a letter dated 5th November 1855 from Messrs. Brown, Shipley and Company of Liverpool to the National Bank of Scotland, Edinburgh, Norris bore a letter of credit from James Bishop for £4,000.

[20] The floor space was approximately 300,000 square feet; it was then in the hands of the Commercial Bank of Scotland.

[21] Bannatynes and Kirkwood, Glasgow, to Henry Lee Norris, 8th January 1856.

This was one of the chief reasons why a three-year lease rather than an outright purchase of the Scottish property was arranged in the first instance. It also explains why the Americans, having decided to establish their manufacture in Scotland, were quick to convert their undertaking in 1856 from an unlimited partnership to a limited liability company under the Joint Stock Company Acts of 1855-56. This conversion resulted in a redistribution of the capital stock which is set out below:

Names of Subscribers	Number of £100 shares taken (half called up) by each subscriber
William Judson[22]	333
John R. Ford	164
Christopher Meyer	164
Spencer T. Parmelee	100
B. F. Breeden	74
Henry Lee Norris	55
James Bishop	55
James A. Williamson[23]	55
	1,000

The Castle Mills were well situated for raw material supplies and the marketing of the finished products. Located in the Scottish capital they had access to the ports of Glasgow and Leith, and excellent canal and rail communications, linking them with the important markets of Great Britain, passed their door. Coal was readily available from the nearby coalfields. Lampblack and coal tar were made at Leith, two miles from the Mill, and were ' very cheap '. Cloth and chemicals were available in northern England, and some of the earliest supplies of crude rubber (and at the outset rubber footwear as well, together with American market intelligence) were sent direct to Edinburgh by James Bishop from New York. Other raw materials were obtained from London and Liverpool. It might also be added here that the Castle Mills possessed a good water supply, an indispensable requirement in rubber manufacture.

In the case of markets, particularly for rubber footwear, it is evident from this correspondence, as it is from other sources dealing

[22] Judson was the confidant and attorney of the American rubber pioneer Charles Goodyear. He was a partner in several of the early American rubber manufactories, and his influence was felt in all major decisions.

[23] Little is known of this man other than the fact that he lived in New Brunswick and was a partner of James Bishop and Company.

with the early history of the industry,[24] that the strongest competition which the Scottish company was likely to encounter in the United Kingdom would originate in the rubber factories of New England. Yet the prospect of competing with American footwear in Britain evidently did not cause Norris and his associates to worry unduly. In fact it was their intention to compete with American products not only in the United Kingdom but also in the United States: 'So look out for The North British shoes in New York. We can afford to pay 30 per cent. (*ad valorem*) and beat all the Yankees, but we will not crow quite yet.'[25] While the company's subsequent history does not confirm that this challenge was fulfilled, the sharp decline in United States exports of rubber products to Great Britain following upon the establishment of The North British Company suggests that the Edinburgh manufactory made substantial inroads into the British market.[26] With the exception of certain low-quality footwear being

[24] A. E. Gordon, *op. cit.*, p. 49. In 1854 the production of the New Brunswick Rubber Company alone amounted to almost one million shoes, 'half of which were sent to Europe'.

[25] Henry Lee Norris to James Bishop and Company, 10th January 1856. A. E. Gordon, *op. cit.*, p. 49, writing almost two decades later, said: 'If it were not for the tariff of 30 per cent. there would be no production in America at all—the English make shoes at a cost of 4 or 5 cents each, while here they cost from 12-14 cents.'

[26] According to the *Foreign Commerce and Navigation Returns of the United States*, U.S. Department of Commerce, American exports of domestic rubber merchandise to the United Kingdom fell continuously from 1855 until 1885:

Year	Domestic merchandise		
	Boots and shoes		Other articles
	Quantity	Value	Value
	1,000 pairs	1,000 dollars	1,000 dollars
1855	472	318	282
1856	138	83	166
1857	86	40	106
1858	61	28	65
1859	8	3	24
1860	3	2	45
1870	1	1	12
1875	—	—	24
1880	—[a]	—[b]	6
1885	17	14	198

[a] Less than 500 pairs.
[b] Less than $500.

A. E. Gordon, *op. cit.*, p. 49: 'There were then (1854) but one or two other factories (rubber shoe manufactories) in America and none in England. Afterwards English works were started, the export trade stopped.' Also important in explaining the decline in the export trade was the increase in domestic demand as the North American continent was opened up. See Edgar M. Hoover, *Location Theory, and the Shoe and Leather Industries* (Cambridge, Mass., 1937), pp. 184-5.

imported from France and attempts made by British manufacturers ' to break up the Edinboro Company ' by price reductions, The North British Company forced the pace on prices as well as discounts.[27] This situation might be explained in several ways. Practising a more superior skill than the British and operating at lower costs than the Americans, it was relatively simple for Norris and his colleagues, once the problems surrounding Hancock's patent had been set aside, to claim a share of the British footwear trade. There is no evidence in the early days of this industry, certainly not as regards rubber mechanicals, of larger firms undercutting the smaller firms because of the economies of scale; yet it is reasonable to think that The North British Company must have enjoyed some advantages of size. More important, however, in contributing to the Americans' success was the indefatigable manner in which they pushed their wares. If there is one aspect of the early history of this American company in Britain which deserves to be stressed above all others it is the attention paid by the Americans to the marketing of their goods.[28] It is apparent that in this field they could and did teach the British manufacturer a good deal, especially since the manufactured article, as well as the raw material, was bought and sold in a well-informed market where price and terms of sale were the all-important factors for most consumers.

In addition to throwing light on American manufacturing and marketing methods in Britain, the records of this company provide evidence of an interesting example of management by remote control. From the first meeting in Edinburgh on 11th August 1857, attended by two resident and two visiting directors,[29] until the ownership of the business passed to the British in the late sixties, management rested entirely with American-domiciled stockholders.[30] Even after this date Americans continued to have a marked influence on the company's affairs. The man who played the leading rôle on the Scottish side in the period 1855-72, after which he returned to the United States, was Henry Lee Norris. For some eight or nine years from 1856, along with his resident American partner Parmelee, he stood proxy at the

[27] See an article by the author, ' Early Entrepreneurial Behaviour in Relation to Costs and Prices ', *Oxford Economic Papers*, New Series, Vol. V, No. 1, March 1953.

[28] Complaining of the inroads made into the British trade by the Americans from Edinburgh, an English company's manager informed his house: ' The North British have travellers and agents in every part . . . and will allow 25 per cent. on even 5/- of goods.'

[29] Henry Lee Norris (General Manager) and Spencer Thomas Parmelee (Works Superintendent); William Judson and Christopher Meyer.

[30] Their meetings were held at the offices of James Bishop and Company in New York.

Annual General Meetings of the company for his fellow Americans. In 1858 Norris and Parmelee elected themselves as ' a Committee with full power to do everything connected with the management and carrying on the business of the company which the Board of Directors could have done if personally present '.[31] This state of affairs did not altogether meet with the approval of the company's solicitor, Mr. John Murdoch of Leith, when he joined the Board in 1859, but his motion put forward at a meeting of shareholders in 1860 ' that two additional directors be elected to co-operate with the Committee of Management here ' went unsupported. Managers of the company continued to be appointed under agreements entered into in New York, and requiring only nominal confirmation by the two American directors in Edinburgh, and no important decision in the company's life was made without the sanction of the New York and New Jersey directors.[32] On the whole, if the few entries made in the company's Minute Books reflect the degree of friction experienced between New Jersey and Edinburgh, the system appears to have worked fairly smoothly.

As important as the American managers in the development of this industry in Scotland was the skill and technique brought to Edinburgh by a nucleus of experienced male and female rubber workers. Throughout the first fifteen years of the company's life key personnel were recruited almost exclusively from the United States. With the machinery on the *Harmonia* came several experienced operatives to train Scottish workers or to occupy key positions such as that of the callender hand in the Edinburgh plant. In 1857 other American workers followed. Several explanations can be offered for this transference of American skilled workers to Scotland. The first is that in the fifties of the last century there were few such operatives available in the United Kingdom. Especially was this true of the footwear branch of the industry, which had remained largely in American hands. In addition, one of the hazards run by the Scottish company in recruiting skilled British rubber workers was that the recruit might only stay long enough to make off with the firm's secrets. Indeed The North British Company pledged certain key personnel under bond ' to preserve the utmost secrecy in regard to the business of the said company and not to disclose to anyone whatsoever such knowledge as he may acquire of or regarding their manufacture or general business '. Apart from these key appointments the Americans

[31] General Meeting of shareholders, 27th May 1858.

[32] For instance, at the General Meeting of 8th July 1864: ' no future engagements to be made with any of the Superintendents or Manager and that no extension of premises or machinery be undertaken exceeding £100 in cost, without previous communication with and approval of the American Directors.'

appear to have had no difficulty in recruiting unskilled labour in the Scottish capital. While the absence of comparative detailed evidence from both sides of the Atlantic makes it impossible to say whether or not the Scottish labour force proved to be 'about half price', as Henry Lee Norris had opined in 1856, it is fair to suggest that it must have been at a considerably lower price than that paid for similar labour in the rubber factories of New England.[33]

From these small origins, as Table I makes clear, the financial resources of The North British Company grew from approximately £25,000 in 1856 to £143,000 in 1871, an increase resulting largely from the high level of profits enjoyed by the undertaking. Indeed, so successful did this venture become that by 1859, despite large dividend payments, the Americans had purchased the Castle Mills and paid off the mortgage of £6,500 on the property held by the Commercial Bank of Scotland. In 1888, when the Company was reconstituted, its paid-up capital had risen to £350,000, but by then the business had passed from American to British control. Undoubtedly this change of ownership, which took place during the second half of the sixties, can be ascribed in part to the difficulties experienced by the company in re-insuring the Castle Mills after the fire of 1863, which caused damage amounting to more than £21,000. It is also possible that in selling their stock several of the Americans were merely anticipating the problems caused by the downward trend of business that had already affected other rubber companies in Britain and on the Continent.[34] Much more significant than either of these reasons, however, is the fact that in 1864 the principal American stockholders began to extend

[33] While many available wage estimates are of questionable value, in that they do not give the number of hours worked, it is worth noting that an American female worker brought to Edinburgh was promised: 'the same wages as are usually paid for hands of her capacity by Ford Rubber Company or the New Brunswick Rubber Company of New Jersey, or should she work piecework they will furnish her with enough to amount to a dollar per day.' The average daily wage for Edinburgh female workers at this time was about 1s. 4d.

[34] In 1865 The North British prospered while other rubber companies were languishing. Announcing the excellent results, the directors pressed upon the shareholders: 'the firm belief that their future prospects depend largely upon the results of the Company's business not being made public. Within the past few weeks one of the Rubber Companies in London has determined to wind up, another Company on the Continent is in a weak state, and a third company who promised a most troublesome competition, has lately had trouble among its disappointed and dissatisfied shareholders. The latter company, might, however, take heart and prosecute with new energy their undertaking if they learn of our prosperity.' Extract from the Minutes of Shareholders, 29th January 1866. Speculative disaster—a constant threat to those purchasing large crude rubber stocks—overtook the company in the following year and, in large part, accounts for the poor trading results.

their commitments in the New Brunswick area.[35] It was these commitments rather than the uncertainty of the British rubber trade that led the Americans to withdraw their capital from Scotland.

TABLE I

THE NORTH BRITISH RUBBER COMPANY LTD., 1856-71

	Sales	Net profit	Dividends declared	Capital Stock[1]	Profits as a percentage of	
					Capital employed	Sales
	£	£	%	£	%	%
1856	...	...	...	25,000	...	...
1857	...	28,050	10	50,000	56	...
1858	...	48,997	25	68,000	72	...
1859	...	64,439	20	92,000	70	...
1860	...	39,624	30	100,000	40	..
1861	...	40,734	35	100,000	41	...
1862	...	26,497	40	100,000	26	...
1863	...	28,702	25	100,000	29	...
1864	...	27,647	10	120,000	23	...
1865	...	37,790	15	130,000	29	...
1866	180,000	12,593	28	130,000	10	7
1867	...	32,783	9	143,000	23	...
1868	...	40,000	25	143,000	28	...
1869	217,100	34,478	25	143,000	24	16
1870	219,300	42,609	25	143,000	30	19
1871	223,000	43.238	28	143,000	30	19

[1] Excluding bank overdrafts and trade credits.

Although the story of the development of the pneumatic tyre must fall outside the scope of this article, it should be remembered that it was under American direction that the Scottish company carried out some of the earliest experiments on solid and pneumatic tyres; and it was the British Dunlop Company's purchase of the American W. E. Bartlett's[36] 'Clincher' patent, in 1891 for $973,300, that permitted the tremendous expansion of the pneumatic tyre industry. While The North British Company has grown and prospered until today it is one of the largest rubber plants of its kind in the world, not a few

[35] A. E. Gordon, *op. cit.*, p. 51. Throughout the sixties these men were increasing their investments in the New Brunswick rubber industry. In 1864 William Judson bought out the Goodyear Elastic Fabric Company. On Judson's death in 1868, Meyer and Ford joined with others to convert this business to the Hyatt Rubber Company, which a year later was again converted to the New Jersey Rubber Company with a capital stock of $200.000. Meyer and Ford were two of the principal officers of this new organisation.

[36] Bartlett succeeded his brother-in-law Henry Lee Norris at Edinburgh in 1871 and remained manager of the company until his death in 1900.

Englishmen have marvelled[37] that this American-led organisation has allowed the British to invade this field which, by virtue of the patented discoveries of American technicians such as Bartlett and Harris, and of its vast knowledge and experience, it possessed so securely.

[37] For instance: 'The Welch patent, however, did not protect us from one formidable competitor, The North British Rubber Company of Edinburgh, against whom we were at a disadvantage since they had a tyre as good fundamentally as our own, and no problem of intermediate profits to consider in its production. Had my father and his team been entrenched in that company's position in 1890, with their valid patent and their great rubber mills, knowledge and experience, I cannot but think that we might have barred the entry of newcomers like ourselves into the industry. I have often marvelled how, with all these trumps in their hand, they did not make more aggressive use of the opportunity which was theirs, for by the sheer strength of their position a monopoly was more in their reach than ours.' Sir A. Du Cros. *Wheels of Fortune* (London, 1938), p. 204.

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BUSINESS MEN ON BUSINESS DECISIONS

I

BEING invited to give an after-dinner address to a society of business men engaged in engineering production and commerce on Merseyside, I had the idea of trying to convey to them very compactly some notion of the kind of questions about business which interest economic theorists and on which the theorists are anxious to get direct testimony. I accordingly composed the explanatory remarks and the list of 'suggested answers' to a number of such questions which here follow. At the end of my explanation a copy of the list of suggested answers was given to each person, and he was asked to allot marks from 0 to 10 to each answer. The results are summarised and commented on along with the list of suggested answers.

II

If there is one question more than another which causes economists to stammer in confusion and tie themselves up in verbal knots, it is 'What is economics about?' Now, when I started to write this paper I had an inspiration. Economics is about business. That answer, generously interpreted, really covers everything. We must understand 'business' to include the housewife devising her household budget so as to get the most out of a given expenditure, the bread-winner seeking that particular type of job where his aptitudes will be most valuable to the community and therefore best rewarded, the business man in the more ordinary and restricted sense trying to discover or invent, and produce as cheaply as possible, something which will please and satisfy the public and so give him a profit, and the Government, which, regrettably as some of us think, has been taking over more and more the functions both of the consumer and of the enterpriser. But here I want to use the word business to mean the special activities of those who initiate and organise production and marry themselves for better or worse to the hazards of so doing. We can, I think, find a single heading under which all these special activities come, a name for the whole of the business man's business: it is *decision-making*. Business decisions ought surely to be one of the

focal points of the economist's study of his field. It is in the act of making a decision that the business man gives a fresh thrust to affairs, that in greater or less degree he helps to make history. Perhaps we can break the problem down somewhat. When the business man makes a decision, he presumably has in mind some guiding purpose or objective, some general policy, and either some immediate plan or at least some pressing problem or emergency. Using a military analogy, we can say that a general's basic purpose is to win a war. His policy may be to wear the enemy down, or perhaps to bring about one decisive engagement in which the enemy's whole force can be annihilated; his immediate plan, by which he hopes to give effect to his policy and achieve his ultimate purpose, will specify in more or less detail, with more or less rigidity, the course of action of all the forces and arms under his command up to some more or less precisely stated future time or situation. Has this analogy any application to the world of business? The textbooks on economics, using the central principle of theory-building, radical and ruthless simplification and abstraction, have usually assumed simply that the business man's basic purpose is to ' maximise his profit ' or his ' net revenue '. This proposition, that the enterpriser has at the back of his mind all the time the dominant purpose of making his firm's income as great as possible, opens up a host of questions falling under several different headings.

First, there are the interpretive or definitional questions: What precisely is it that is sought to be maximised? Is it

A (i) Net profit before tax?

(ii) Net profit after tax payable by the firm?

(iii) Net profit for the immediate future, *e.g.* a quarter or half year or one year?

(iv) Net profit averaged over the next five years?

(v) Net profit averaged over the next ten years?

(vi) Net profit averaged over the next thirty years?

(vii) If it is net profit averaged over a period, is the average ' unweighted ', so that as much importance is given to the profitability of the firm ten years hence as next year, or is greater weight given to the more immediately future years?

Or is it not profit at all but

(viii) The general prosperity of the firm, where we include in general prosperity the maintenance of the goodwill of a body of customers or the esteem of the public at large?

(ix) The firm's net worth as estimated within the firm?

(x) The firm's liquid position or balance-sheet strength?

(xi) The firm's prestige as an enterprising, efficient, technically progressive, financially sound, humane and high-principled concern?

Or is it rather

(xii) The personal reputation or self-esteem of the moving spirits of the firm, their prestige as heads of a firm which has the attributes listed under (xi)? Does the head of the firm identify himself with his business so that its success is his success?

I would like to try to make clear the point of some of these distinctions.

In the economic textbooks we find sentences like this: 'In order to maximise its net revenue, the firm must set its output at that level where marginal revenue is equal to marginal cost.' Now the actual behaviour that conforms to this rule may be quite different according to whether the net revenue considered is merely that of the ensuing week or month, or is reckoned in some way over a long future period in the life of the firm. If the firm's object is to maximise its profit from month to month, it will perhaps take advantage of any general shortage of the type of product it makes to ask a higher price so long as the shortage lasts. But what will be the effect of such action on its market and its customers' goodwill in the long run? The maximising of profit in the short term and in the long term may be incompatible objectives, calling for different policies.

So much for questions A (iii) to (vi). What arises from question (vii) is both more subtle and more topical. It really amounts to asking: How do we reckon the *success* of an enterprise? Is a firm to be called successful if it has for a long time been making good profits, or if it has made them for a short time in the recent past, or if it 'is making' good profits (but what, precisely, do we mean by 'is making'?) or if it seems to be going to make good profits? Is success something which is reckoned at a point of time or over a period? And if over a period, is this a past or an expected period? Or shall we say that a firm is successful if its recent history gives promise of prosperity over the next few years? In calling this question topical I have in mind the bearing it seems to have on the topic of take-over bids.

I do not think there is any need for me to discuss questions A (viii) to (xi), and I shall pass on to A (xii). It is sometimes said that the classical 'enterpriser' of the textbooks is dead, his mantle torn in two and his functions divided between the equity shareholder on the one hand, as provider of risk capital, and the salaried executive on the other, as decision-maker. The textbook enterpriser was a man who owned capital which he was ready to risk on ventures of highly uncertain outcome, ventures which might bring him a very large gain, or might equally well lose him his stake. He was thus the uncertainty-bearer. One decision at least was evidently taken by him, the decision

which venture or what type of venture to back. But he was also the director of the enterprise, deciding the precise character of the product, the method of production and the scale, type and timing of extensions and improvements of plant. The textbook enterpriser did not merely subscribe to the share-issue of a shipping company, he bought a ship of a specified type, decided what trade it should engage in, and indeed assumed the business responsibility for the venture in all important respects. Nowadays, it is said, such people only exist in a small way of business. Typical of them perhaps is the barrow-boy, who nevertheless sometimes makes a fortune. In large-scale concerns, it is contended, the decision-maker has not provided the capital and therefore will not lose his own fortune if things go wrong, and therefore (and this is the point) he will not behave as he would if the capital which he controls did in fact belong to him. Against this view, however, it has been pointed out that the unsuccessful business executive will soon have nothing to manage; his own prosperity and his prestige, which may mean more to him than money gain, is as much bound up with the firm's success as if he owned it. A third view, which to me seems cogent, is that the business executive *identifies* himself with the enterprise which he directs, and is thus strongly interested in ploughing back profits rather than paying them away to usurious shareholders, even though those shareholders are the legal owners of the firm. He wants the profits to be used to build the living tissue of the organism which provides his life with its meaning, not bled away in dividends.

So much for the nature of the ultimate objective. Let us turn now to a second set of questions, concerning the policies which business men adopt in pursuit of the objective. A policy is not a book where you can look up the answer to the question, 'What do I do in these circumstances?' whatever the situation or emergency that has arisen. The politician's habit of replying to parliamentary questions by saying, 'I cannot answer questions about a hypothetical situation,' is not so unreasonable as it sounds, for it is impossible, in the nature of things, to specify in advance everything that is relevant about a hypothetical situation. It is impossible, for example, to specify fully the knowledge and experience in the light of which, at that future date, the situation will be viewed by this person and that. Thus such a question as, 'What would you do if such and such happened?' is not worthy of an answer, for such and such can in the nature of things be only incompletely described. Nevertheless a policy is a useful and necessary guide. It gives you a 'line', if not detailed directions for following it. Let us ask, then, what is the business man's 'line' on certain matters?

One thing that interests economists very much is how business men decide upon the prices they ask. Here I again suggest a choice of answers to be ranked in order of truth or accuracy:

B (i)-(iii) I know the total cost T of any number N of units of product, and for each possible output N I know what difference ΔT would be made to T by changing from N to N + 1. I also know the sale-proceeds S of any output and consequently what difference ΔS would be made to S by changing from N to N + 1. I choose N so that $\Delta T = \Delta S$ and then set price equal to $\frac{S}{N}$. (This is what the textbook says.)

(iv) I select a figure for my intended or expected output N, and divide the total Q of my overhead costs by N. To this I add the unit direct cost (for labour, power, materials, etc.), say $\frac{D}{N}$, and an arbitrary percentage mark-up for profit, say p, so that my price comes out as

$$(1 + p)\frac{Q + D}{N}$$

This is the answer that business men themselves sometimes appear to give. It raises the further question of how the business man decides upon his output. Here he might perhaps say:

(v) I take the largest output that I can produce without overtime.

(vi) I take an average of the experience of the corresponding month in the past three years.

(vii) I produce what I think I can sell at the price which covers direct and overhead costs and allows me my usual percentage mark-up. When trade is bad, I am willing to take a cut in my percentage of profit, to the point where I think my total profit over the whole output (as distinct from profit per unit of output) will be kept up to the highest figure possible. This total profit will be p (Q + D), and I am willing to reduce p if the resulting increase of N and therefore of D is sufficient to increase pD by more than the associated decrease of pQ. In extremely bad trade conditions I would even reduce price below $\frac{Q + D}{N}$ to any level where it gave me any contribution at all towards overheads, the absolute lower limit being $\frac{D}{N}$, since below that I should be actually out of pocket on current expenses (*direct* costs not covered by sales-proceeds).

The answer B (vii) calls for comment. A little reflection will show that it amounts to the same thing as answer B (i). The point and purpose of the policy described in answer (i) is to make the total profit S - T as large as possible by pushing output N up to that level where to push it any further would add more to its total cost T than to its sale-proceeds S. But this is also just what policy B (vii) aims at.

Under B (vii) that price is sought which, taken together with the output that it will enable to be sold, will keep the excess of sale-proceeds over direct costs as high as possible. Economists have been tremendously exercised by the apparent collision between the policy recommended by the textbook and the policy which business men themselves, in the enquiry conducted by the Oxford Economists' Research Group before the war, affirm that they adopt. Some economists have maintained that the textbooks must be rewritten, others that the two policies come to the same thing in effect, and that what has come to be called the 'full cost principle' described by the business men really applies the textbook criterion of rational conduct through a process of trial and error.

I turn now to the second matter on which I should like to find out what is the business man's line, a matter which to me personally is even more interesting than the basis of price policy, namely, how does the business man decide when, on what scale, and in what precise form to enlarge or improve his productive or commercial facilities, his plant and equipment or his premises or his material business outfit in any sense? Economists call such acts 'investment'. By *investment* they do not mean the act of subscribing to a new issue of shares or of buying existing shares on the Stock Exchange, but the act of ordering new machines, installations or buildings for use in their own business. The question of how the business man's mind works and what materials it works with in approaching a decision whether or not a particular investment proposal is worth while or not is one of the most fascinating, to my mind, in the whole of economics. Here again we have a clash between the textbook and the business man's own testimony. The following are some of the answers which have been put forward:

C (i) A block of equipment will be bought if its expected net earnings in future years, when each such annual instalment is discounted to the present at the current market interest-rate on loans of the appropriate term and the resulting 'spot cash equivalents' are all added together, give it a valuation not less than its supply-price.

I interpolate here a more extended statement of the suggested calculation. Actuaries constantly use the notion of the 'present value of £1—deferred t years'. Let us represent this present value, which with an interest rate of r per cent. per annum is of course $\frac{1}{\left(1 + \frac{r}{100}\right)^t}$ by x_t. And let the number of £s which the proposed block of equipment is expected to add to the firm's profit in future year t (counting

the immediate future year as 1) be G_1. Then v, the 'present value' of the piece of equipment, means, in the economists' vocabulary, the total of all such terms as x_tG_t for every value of t from 1 up to the most distant year in which the equipment will earn anything at all. If the equipment can be bought for less than v, says the textbook, it will be bought. Or, more precisely, such a volume of orders will be given per month or per year for equipment of this type as will drive up its supply-price to equality with the valuation set on such equipment by the least sanguine of those who actually give such orders. This answer, C (i), is the *formal* answer to be found in Keynes's *General Theory of Employment, Interest, and Money*. I will leave comment on it until later.

C (ii) To be deemed worth buying, a block of equipment must be expected to pay for itself in from three to five years, or, in other words, the expectation must be that in each of the first three to five years of its life it will add to profits, over and above what they would have been without it, an amount equal to one-fifth or one-third of its first cost. Sometimes the required expectation of annual earnings is put as high as one-half of first cost. This is the answer given by business men.

Now this answer is to me, and I think to many other economists, extraordinarily puzzling. A large firm may put several hundred thousand pounds to reserve each year; does it keep the accumulated amount on current account at the bank, earning no interest? Until the money is needed for some purpose connected with the firm's proper business or some enlargement of its interests, will not the money be put into Government stock or some other form in which it will earn from $2\frac{1}{2}$ to 5 per cent. per annum? Would not the directors of such a firm regard a policy of keeping their reserves on current account at the bank as wasteful, as implying the throwing away of a perfectly good annual income of several tens of thousands of pounds perhaps? But, if so, how can they possibly explain their reluctance to put such money into blocks of equipment (improvements or enlargements of plant) which would earn annually five or ten times as much? It is this question which, more than any other, I should like to discuss here. As before, I suggest an explanation, which is to be awarded marks according to its closeness to the truth:

C (iii) A business man is willing to instal a new machine even if he *does not count on its doing much more than pay for itself*, provided it promises to do this in a very short time. Why should he insist on being able to expect this swift recoupment of his outlay? May it not be because he feels that he can see fairly clearly and confidently only a year or two ahead, that while he feels he can dismiss from his thoughts

the possibility of the machine being superseded by a better design or a radically new method immediately after he has installed it, he feels no such confidence about the future beyond two or three years ahead? It would be reasonable for a business man to argue thus:

'I should be glad to earn 8 or 10 per cent. on the money I have put to reserve, instead of the 3 or 4 per cent. I am getting by keeping it in Government stock, but the only reasonably safe way of doing this in my own business is to find some scheme which will give very great benefits over a few immediately future years, since any benefits are more likely than not to disappear at the end of that short time through imitative action by my competitors, or the invention of still better methods.'

If the business man said this, we could suppose him to have in mind this sort of picture:

Year . .	1	2	3	4	5	6
Difference made by the machine	—£100,000 (first cost)	+£25,000	+£50,000	+£30,000	+£15,000	
		Operating profits				

Such an explanation would fit at one and the same time all three of the statements:

(1) The proposed block of equipment is expected to earn in each year, for a few years, between 20 and 50 per cent. of its first cost.

(2) It is expected to pay for itself in three years.

(3) If the initial outlay of £100,000 were a loan repayable by instalments according to the same schedule as that of the expected earnings, the *yield* in the actuarial sense would be about 8 per cent.

I shall conclude with one or two supplementary questions on investment decisions. Answer C (i) implies that a decision whether or not to buy a block of equipment will be influenced by the prevailing market interest-rate, represented, for example, by the yield of Consols. For this is one of the important rival uses of the money which would have to be laid out on the equipment. If the business man is proposing to invest his own reserves, this market rate of interest is one possibility which he is sacrificing; or if he is proposing to borrow money on debentures, this is one of the important counter attractions which he will have to out-bid. The particular form in which answer C (i) introduces the interest-rate may strike the business man as unfamiliar, but the essential point is not affected: a rise in the system of interest-rates will *reduce* the spot-cash equivalents $x_t G_t$ of

earnings of a given amount expected at a given future date, and thus weaken the inducement to buy the block of equipment in question. Thus I would like to ask:

C (iv) In deciding whether or not to instal a specified block of equipment, is the business man influenced by the prevailing market interest-rates as represented by the yields of Government securities?

In 1938 I ventured to put forward a theory of the business cycle in which the central idea was that when a business man has just installed an important new block of equipment, he will not immediately proceed to consider further improvements or extensions but will need a period of a year or two to get the new equipment which he has just acquired assimilated into his existing outfit, to get it run in and tuned up, to find out its effect on the flow of production in his whole works, to see how far the increased capacity is matched by increased sales and so on. So my last question is:

C (v) Does a business progress by alternating phases of active enlargement or modernisation of equipment and of consolidation, running-in and experiment to get the best out of the equipment as it exists?

III

The list of suggested answers to the questions which have been introduced above and which were handed to each member of the audience is reproduced below as Appendix I. The marks assigned by the audience are tabulated in Appendix II.

There are many evident difficulties in interpreting the markings given by the business men. This enquiry, in which only a small roomful of people took part and in which, after listening for some fifty minutes to the explanatory address, each business man gave well over an hour of concentrated study to the written list of suggested answers and the process of marking it, is plainly far removed from the ordinary procedure of sending a short list of tersely expressed questions by post to a relatively large number of people. Doctors sometimes express a preference for ' clinical evidence ' over ' statistical evidence ', presumably on the ground that it is better to have detailed pictures of a few cases than formal cut-and-dried particulars of many cases. Perhaps a somewhat similar idea may do something to make my experiment seem worth while. What I am attempting to explore on this exceedingly modest scale is a technique of ' systematic impressionism ' rather than statistics, for there can plainly be no question of applying formal

statistical techniques, or indeed of doing anything except the very simplest grouping, tabulation and inspection of the marks. In the accompanying Table I the mark given by each business man to each answer is separately shown. Each row of the table belongs to one answer, each column to one business man, whose description of his firm and of himself heads the column. Some of those taking part have put a dash, or nothing at all, against some of the answers instead of awarding an explicit nought, and Table I reproduces these dashes and blanks, which in interpreting the marks I have treated as noughts. It will be seen that towards the left of Table I there are nine firms described as 'small' or 'medium' and towards the right there are four firms described as 'large' and one whose size was not indicated while on the extreme right are the marks given, on the basis of his contacts with business men, by a Youth Employment Officer. He, and the firm of unstated size, have each given two sets of marks, one referring to small firms and one to large firms. Thus we have eleven columns of marks referring to 'small' or 'medium' firms and six columns referring to 'large' firms. For each row of the table, *i.e.* for each answer, I have taken the total of the eleven marks for the small and medium firms, the total of the six marks for the large firms, and the grand total for all firms. The result is shown in Table II with the maxima that could have been scored if every firm had given the answer ten marks.

The business men were in effect asked to give opinions on three questions:

A. What does the business man seek to maximise?
B. How does the business man decide his price?
C. How does the business man reach his investment decisions?

I think their evidence warrants the following comments:

A. *What does the business man seek to maximise?* The marks suggest that it is net profit after rather than before tax; that for small firms it is, above all, profit of the immediate (up to one year) future, and secondly, profit over the next five years; for large firms 'the next five years' gets slightly more marks than 'the immediate future'. The suggestion that it is net profit over a period of years with more weight given to the more immediately future years gets about half marks. 'The general prosperity of the firm [and] maintenance of goodwill', and 'the firm's prestige' both get very high marks. These high marks, which are one of the most striking features of Table II, suggest that firms are more far-sighted and prudent, and also less materially minded, than the economist's ordinary assumptions suggest. There is no great enthusiasm for internally estimated net

worth or even for balance-sheet strength, but this latter gets slightly better marks than ' the personal reputation of the head of the firm '.

B. *How does the business man decide his price?* Equating marginal revenue to marginal cost gets distinctly poor marks. One of the most definite verdicts in the whole enquiry is that in deciding his price the business man does not ignore his competitors. This suggested prevalence of an oligopolistic market attitude may reflect the character of the sample, which consisted largely of engineering firms. The ' kinked demand curve ' gets a very modest vote. ' Full cost pricing ' is better supported than the equating of MR and MC, but there is no enthusiasm. On methods of estimating output for the purpose of imputing overheads per unit of output for the purpose of full-cost pricing the marks are more interesting: they show a distinctly favourable response to a suggestion—B (vii)—which would go some way to reconcile ' full cost pricing ' with the equating of MR and MC.

C. *How does the business man reach his investment decisions?* Amongst the suggested answers on investment policy, the comparison of marginal efficiency of capital with market rate of interest gets a poor mark. There is general agreement that two years is shorter than the time in which most firms require a proposed new block of equipment to pay for itself. ' Five years' gets far the highest mark of the three suggestions. Answer C (iii), which I think may be a new interpretation of evidence obtained in past enquiries, also gets a comparatively high mark.

No more is claimed for this little experiment than that it may indicate a possible way of securing the interest and attention of very busy and pre-occupied business men in questions of economic theory for which they would otherwise have no time. It only remains for me to thank with the utmost sincerity those who entered so kindly and so keenly into the spirit of this ' game '.

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APPENDIX I

You are requested to assign a mark from 0 *to* 10 *to each suggested answer to each question. The marks assigned to all the suggested answers to any one question need not add up to any particular total. If, for example, a high mark is given to every answer to one question, this marking will be understood to mean that each answer would be right in one or other set of frequently arising circumstances.*

Question A	The business man is chiefly anxious to increase:	*Mark Awarded*
(i)	Net profit before tax.	
(ii)	Net profit after tax payable by the firm.	
(iii)	Net profit for the immediate future ($\frac{1}{4}$, $\frac{1}{2}$, or 1 year).	
(iv)	Net profit over the next 5 years.	
(v)	Net profit over the next 10 years.	
(vi)	Net profit over the next 30 years.	
(vii)	Net profit over a period, giving greater 'weight' to the more immediately future years.	
(viii)	The general prosperity of the firm, including the maintenance of the goodwill of a body of customers and the esteem of the public at large.	
(ix)	The firm's net worth as estimated within the firm.	
(x)	The firm's liquid position or balance-sheet strength.	
(xi)	The firm's prestige as an enterprising, efficient, technically progressive, financially sound, humane and high-principled concern.	
(xii)	His personal reputation, prestige and self-esteem as head of a firm having the attributes listed under (xi). The heads of the firm *identify* themselves with the firm.	

APPENDIX I (*continued*)

Question B — The business man decides the price of his product in the following way: *Mark Awarded*

(i) I choose a price such that, having regard to the respective outputs which various prices would enable me to sell, a small lowering of this price would add more to the total cost of the output than to the total sale-proceeds, while a small rise of price would take away more from sale-proceeds than from costs.

(ii) In deciding on the price of my product I ignore competitors.

(iii) I have to reckon that a lowering of my price will be immediately followed by a lowering of my rivals' prices, but a raising of my price will not be imitated by them.

(iv) I select a figure for output N, and divide the total Q of my overhead costs by N. To this I add the unit direct costs (for labour, power, materials, etc.) say $\frac{D}{N}$, and a percentage mark-up for profit, so that my price comes out as

$$(1 + p)\frac{Q + D}{N}$$

In deciding output N for this purpose I use the following principle:

(v) I take the largest output that I can produce without overtime.

(vi) I take an average of the experience of the corresponding month in the past three years.

(vii) I produce what I think I can sell at a price

$$(1 + p)\frac{Q + D}{N}$$

In times of bad trade I cut p and in very bad trade I am willing to cut price almost down to $\frac{D}{N}$

Question C — The business man decides whether or not, at a particular time, to instal a specified block of equipment, by applying the following test:

(i) Let G_t stand for the addition to profit which the proposed equipment would be expected to make in year t, counting the immediately future year as year 1. Let x_t be the present value of £1—due in year t. Then if the sum of all terms $x_t G_t$ comes to more than what it would cost to instal the epuipment, I order it.

(ii) To be deemed worth while, a block of equipment must be expected to pay for itself in

(*a*) 2 years or earn in each year 50 per cent. of its first cost;

(*b*) 3 years or earn in each year 33 per cent. of its first cost;

(*c*) 5 years or earn in each year 20 per cent. of its first cost.

The interpretation of this requirement is:

(iii) The block of equipment would have to be expected to earn 20, 33, etc. per cent. of its first cost for a just sufficient number of years to cover its first cost and yield a moderate net gain.

APPENDIX II — TABLE I

Questions	Small private company (engineering). Staff approx. 50	Small firm of machine tool merchants controlled by proprietors	Director of a small private limited company	Small firm in personal ownership, capital £40,000 with 50 employees	Company Secretary of small private limited company manufacturing mass-produced articles	Managing Director of small private limited company (hardware manufacture)	Small firm of manufacturing mechanical engineers, individually owned	Sales engineer of firm of electric motor manufacturers	Medium-sized engineering family business	Non-ferrous metal and cable manufacture on a large scale	Large public company in the electrical industry	Large public company	Chief plant engineer, large company (tele-communications)	Firm's own size not indicated Marks refer to the practice of		Youth Employment Officer Marks refer to the practice of	
														Small companies	**Large** companies	Small companies	Large companies
A (i)	2	..	3	..	..	..	1	..	7	6	4	..	7	4	4	8	..
(ii)	3	..	6	10	4	5	1	5	4	8	8	10	4	5	5	..	..
(iii)	..	10	10	10	3	3	2	8	4	1	4	10	8	1 year [10] *d*	1 year [10] *d*	10	2
(iv)	5	..	6	5	9	10	2	5	5	10	3	10	6	7½	..	4	8
(v)	3	..	4	..	7	5	2	..	6	10	..	3	1	..	2½	2	9
(vi)	3	..	2	..	..	1	2	..	3	10	..	..	..	..	..	..	4
(vii)	3	..	8	7	5	7	2	4	4	5	10	6	5	8	8	6	3
(viii)	5	10	8	10	6	10	10	10	10	10	10	8	10	10	10	2	6
(ix)	3	5	3	2	4	6	8	..	4	..	8	2	5	7½	..	4	4
(x)	5	5	10	5	5	7	8	..	8	5	..	8	8	7½	..	5	5
(xi)	7	10	4	10	8	10	10	10	8	10	10	10	10	6	10	..	8
(xii)	3	5	5	5	5	8	10	2	6	..	2	..	7	6	10	4	6
B (i)	1	10	10	..	3	8	2	..	3	5	..	8	1	[8] *c*	[8] *c*	..	..
(ii)	..	..	..	10	2	..	..	..	5	1	5	..	..	'This is never done except in monopoly'		..	..
(iii)	4	..	8	2	8	1	5	5	6	1	..	6	7	..	..	2	6
(iv)	5	10	..	10	7	..	3	10	8	..	10	9	3	..	..	..	..
(v)	5	..	3	10	5	5	..	..	8	..	6	6	..	..	..	8	8
(vi)	3	10	5	..	5 *a*	6	5	6	7	5	6	8	8	..	..	..	..
(vii)	5	10	1	..	..	8	5	10	8	..	8	8	3	..	..	6	6
C (i)	8	10	3	..	..	5	6	10	5	..	8	2	..	..	..	..	..
(ii) (*a*)	..	..	6	..	..	3	1	0	6	..	..	6	3	[10] *d*	..	..	..
(ii) (*b*)	..	..	10	..	8	7	1	10	7	..	8	6	8	..	..	..	..
(ii) (*c*)	..	10	4	10	4	10	5	4	8	10	9	10	..	..	[10] *d*	..	..
(iii)	5	10	7	10	..	6	..	8	4	[8] *b*	..	7	..	..	..	8	8

a 'depending upon the article'

b '20 per cent. is on the high side. 10 per cent. nearer' [interpreted as a mark of 8 for the answer]

c Written comments suggest a mark of 8

d Written comments suggest a mark of 10

Table II

Answers \ Firms	Small and medium (possible mark 110)	Large (possible mark 60)	All (possible mark 170)	Answer \ Firms	Small and medium (possible mark 110)	Large (possible mark 60)	All (possible mark 170)
A (i)	25	21	46	B (i)	45	22	67
(ii)	43	35	78	(ii)	17	6	23
(iii)	70	35	105	(iii)	41	20	61
(iv)	58	37	95	(iv)	53	22	75
(v)	29	25	54	(v)	44	20	64
(vi)	11	14	25	(vi)	47	27	74
(vii)	54	37	91	(vii)	53	25	78
(viii)	91	54	145	C (i)	47	10	57
(ix)	46	19	65	(ii) *a*	26	9	35
(x)	65	26	91	(ii) *b*	43	22	65
(xi)	83	58	141	(ii) *c*	55	39	94
(xii)	59	25	84	(iii)	58	23	81

ECONOMIC WELFARE AND MONEY INCOME IN THE HIGHLANDS, 1750-1850[1]

THE traditional Highland economy has sometimes been regarded as an isolated subsistence system in which economic welfare depends almost entirely upon the area of arable land available for each family and upon the effectiveness with which it is cultivated. But the Highlander of history, like the Highlander of the present day, produced to sell—and often in distant markets—as well as for immediate consumption, and the Highland economy has long been entangled with the commerce of the Lowlands. Fluctuations of population and of income have depended, therefore, upon the run of prices as well as upon changes in cultivating technique, variations in soil fertility or autonomous demographic development. The present article attempts to show how Highland economic development between 1750 and 1850 is partly to be explained by the commercial factor.

I

In the eighteenth century almost all Highlanders were members, in one capacity or another, of 'farms', settlements in each of which would dwell a number of tenants, together with some men of subordinate status, cottars, crofters or servants, who also occupied some land but as sub-tenants of the greater peasants. There is no need to emphasise the substantial self-sufficiency of these settlements. Pure household production lasted in greater purity and vigour in the Highlands than in the more commercialised south. 'Every man,' it was said, '. . . is Jack of all Trades . . . so convenient in general, and so well adapted to all really useful purposes in their cloaths, furniture and implements, that the want of regular tradesmen and mechanics seems to be but little felt.'[2] In addition, where special skill or equipment was needed, small tradesmen would round out the productive power of the neighbourhood economy.

[1] For the purpose of this article the Highland area is taken to comprise the greater part—both insular and mainland—of the counties of Perth, Argyll, Inverness, Ross and Cromarty, and Sutherland, but to exclude Lowland Perthshire and the easterly arable strip of Inverness, Ross and Cromarty and Sutherland.

[2] F. M. Eden, *State of the Poor* (1797), I, p. 558.

Thus the Highlander, always a farmer and often a fisherman, was content with the diet which had emerged from his environment (with the important addition in the later eighteenth century of the potato): he laboured his land and worked his boat to provide, as far as was physically possible, a sufficiency of the staples—meal, fish, dairy produce and potatoes—on which, almost exclusively, he lived. Most of his household goods he manufactured at home, with the aid of his family or of the semi-specialised craftsmen—weavers, tailors, blacksmiths and shoemakers—who were scattered among the farms. Woollen and linen cloths were made largely within the household (with some aid from the customer weaver) from the wool of the small flock of sheep that was attached to every holding and coloured by the natural dyes of the hillsides; shoes were produced sometimes by the user himself, sometimes by 'broguemakers', from the hides, tanned and untanned, of the cattle which did not survive to be sold to the drover; earthenware, wooden culinary implements and furniture were roughly fashioned in the home without any flowering of craft traditions; fuel, in the form of peat, was generally plentiful, if only to be won by excessive labour (again, of course, unspecialised). Thus, and with a few purchases of metal goods, and possibly of stone and earthenware, the ordinary peasant—we are not concerned with the tiny aristocratic minority of tacksmen and proprietors who lived on a different standard—ensured his comfort and survival.

Buildings and the rudimentary capital equipment of agriculture and fishing were also largely of local construction. 'Every man is the architect of his own house'[3]—a black house, made without glass, planed timber, mortar or slates. Agricultural implements, sledges (generally used in place of carts) and boats were constructed with timber, leather thongs—or even thongs woven from heather twigs—and iron (at the cutting and bearing parts) by the farmer himself, the ploughmaker or the boatwright. 'The spades, ploughs, harrows and sledges, of the most futile and imperfect kinds, with all their harnessing, are made by the farmer and his servants: as also the boats with all their tackle.'[4] Nets also were made locally, and ropes, panniers and baskets were fashioned from bulrushes, reeds and heather. Grinding was carried out often simply by hand quern, or in only the simplest of mills, in which the grindstone connected with the driving wheel by a single gearless shaft.[5]

[3] *Statistical Account of Scotland* (1790-8), III, p. 374. This is referred to in what follows as *O.S.A.*

[4] Dr. John Walker, *An Economical History of the Hebrides and Highlands of Scotland* (1812), II, pp. 374-5.

[5] E. C. Curwen, 'The Hebrides—a Cultural Backwater', *Antiquity*, Vol. XII, p. 284.

Yet for all the ingenious artifice and simplicity of life of the neighbourhood economy, a niggardly environment would not allow the small community to live in self-sufficient isolation; the maintenance within the land framework of the Highlands of a population at the level of the mid-eighteenth century, even at the barest peasant standards, involved nearly every Highland producer in a wider relationship with the commercial systems of the Lowlands and of England. The changing terms of trade between Highlands and Lowlands is one of the important keys to understanding the course of Highland economic development.

The inadequacy of the local food production, for example, pressed the Highland areas unavoidably into dependence on the regions of grain surplus. A very few districts north of the Highland line—apart from the flatter eastern lands of Inverness and Ross—had a steady surplus of grain to distribute through the neighbouring country; such were Kilmuir (Skye), Glen Urquhart and parts of Speyside.[6] Some few parishes, too, might have a self-sufficiency in the better years. But far more characteristic of the Highlands was the parish that year by year had to import part of its supply of meal. From occasional passages we can glimpse the movement of this trade about the middle of the century.[7] For the seventies we have Pennant's evidence that large parts of the central and western Highlands were able to subsist only by large imports of meal,[8] and for the last decade of the century a more complete picture is discernible, doubtless of the same pattern as had lain hidden in earlier years, showing the transport of meal, in some bulk, into all parts of the Highlands.[9] From Lowland Perthshire meal would be carried into the nearby hills, from Buchan and Moray into Strathspey and Lochaber, from eastern Ross, Sutherland and Caithness, by the long straths, into the interior. Along the western seaboard provisioning was done by sea transport often from considerable distances.[10]

Owing to the scarcity of natural resources, the raw materials for even a thin stream of locally manufactured goods and items of equipment had in part to be brought from richer lands. Age-long depredations on the forest covering had left a timber inadequacy, the more serious in that timber was the main technological material, used in the manufacture of implements and boats, and of household equipment

[6] Sir John Sinclair, *General Report of the Agricultural State and the Political Circumstances of Scotland* (1814), IV, p. 48; *O.S.A.*, II, p. 552.
[7] Forfeited Estates Papers, General Management, Nos. 93, 128, 196.
[8] Thomas Pennant, *A Tour in Scotland* (1769-72), I, p. 229; II, pp. 320, 354, 366, 414.
[9] See, particularly, the trade of specific parishes in *O.S.A.*
[10] *O.S.A.*, V, p. 299; XI, p. 423.

and furniture, and was an essential in the frame of even the most meagre dwelling. 'Want of wood,' it was said, 'leaves them no materials.'[11] From a few districts, including Strathspey, the eastern Grampians and parts of Argyll, the cutting and export of timber was still possible,[12] but, much more commonly, substantial quantities had to be imported, mainly from the Baltic. Particularly acute was the shortage in the islands, which were bare of trees and 'destitute of wood'.[13] Iron was still so precious as to be used only under supreme technological necessity; in any case there were few men who could adequately work it. But an indispensable minimum for plough parts, hooks, needles and vats (used, for example, in distilling), was worked, still apparently from Lowland bar iron, although small smelting units had moved into the area. Fishing, even the desultory, part-time practice of the farmer, also required some specialised raw materials—sailcloth, hemp for nets and tackle, and salt. Shortage of bark caused the import even of a material so native to the Highland environment as leather.

Such shortages were of the daily life of every peasant. Some of the expenditures were doubtless light and postponable but the meal bill at least was constant and heavy, sucking in a good deal of the money surplus of farming. Nor did the money commitments of the peasant end there. He derived his land from an aristocracy straining after goods and privileges that could be obtained only in the Lowlands; he was therefore forced to pay in cash rather than in kind. Renders of raw produce and direct labour on the farms of proprietors and tacksmen roused the fury of eighteenth-century progressives scenting 'feudalism' (the most vituperative word at their command) in any such imposition; but much heavier in fact, at least on the larger estates (for which we have better records), was the money rent. On a sample of eleven widely dispersed estates rents in money in every case amount to at least three-quarters of total rents.[14] And money rents were not only universal, they were also heavy; together with the meal bill they would absorb almost the whole cash product of farming, or, in other words, almost the whole return of animal husbandry in an area where pasture was the main resource of nature. It is true that non-payment of rent would only infrequently be followed

[11] Dr. Samuel Johnson, *A Journey to the Western Isles* (1933 edit.), p. 92.
[12] James Robertson, *General View of the Agriculture in the County of Inverness* (1808), p. 206; James Robertson, *General View of the Agriculture in the County of Perth* (1799), pp. 231-2; *O.S.A.*, V, p. 195.
[13] James Macdonald, *General View of the Agriculture in the Hebrides* (1812), p. 85.
[14] Taken from the Forfeited Estates Papers, and from the Register House (Edinburgh) collection of Rentals and Valuations.

by eviction—the monetary strain on the peasant is, indeed, indicated by the speed with which arrears gathered if the crop fell short (increasing the need to buy meal) or cattle prices dropped—but this casual procedure had its disadvantages, involving the tenant in debt, and encouraging the landlord to raid the cattle stocks of his tenantry and to seize any windfalls for the payment of past debts. General indebtedness, such as arose on the best managed estates from time to time, helped to break up any peasant accumulations of capital and to destroy any beginnings of a greater peasant or yeoman class.

In this tangle of individual needs and of complicated credit relationships between tenant and landlord money lay at the centre. And it was the ordinary tenant—the cottar fell below the level of full participation in the money economy—who accounted for most of the demand for food and essential raw materials. Even the funds of landlords, used for 'luxury' expenditure in the Lowlands, or, in a country without any mercantile middle class, to supply capital for projects of various types, or in time of crisis to inject extra supplies of food, were derived in the longer run from the rent payments of the small tenants who held by far the greater part of the land. The money income of the small farmer, then, was of crucial importance both to himself and to a fully viable economy.

II

The 'money' so required had to take the form of claims against the Lowlands, for there was little local circulation; that is, it would be either cash or, more frequently, bills of exchange created by sales of Highland produce in Lowland markets. The main activity was farming and the main saleable product, and one which could overcome the transport difficulties, was cattle. Sheep were kept by every holder of land but were never regarded 'in a commercial light', and in the main horses were kept only for farm work or general labouring. 'The Highland tenant has seldom any corn to spare and most commonly is obliged to purchase a great part of his consumption; he therefore can pay no rent out of his corn produce; but he pays it chiefly from the sale of lean cattle.'[15] Cottars and crofters, it is true, did not always participate in the cattle trade, but full tenants, who made up something like half the population, invariably kept a small stock 'for sale to drovers who carry them to the Lowlands and to England'.[16] Pastoral

[15] Sir John Sinclair, *General View of the Agriculture in the Northern Counties and Islands of Scotland* (1795), App. V.

[16] Macdonald, *op. cit.*, p. 430.

husbandry and the consequent payments from Lowlands to Highlands, though everywhere of significance, varied in relative importance from region to region. In the east, along the greater straths and around the foothills, where arable land was comparatively plentiful, stocks of cattle, although universally kept by the tenants, were often small. Around Loch Tay, for example, the typical tenant kept between five and ten head of cattle;[17] the annual sales from such a stock would yield between £1 10s. and £6. In the north-west, on the other hand, tenants had more cattle, the average stock consisting in most localities of between ten and fifteen beasts, enough to yield a money income of up to £10. In every district of course there were considerable differences between the possessions of the greater and of the lesser peasants, but generally there was an upper rank of men who might expect to sell three or more beasts in the year.

Other farm products yielded little in money. In the far north, from Strathnaver, and in the south-west, from the island of Islay, horses (or colts) were bred for sale, but the trade was limited and local.[18] Here and there dairy products might be sold—from Kintyre to the Clyde markets, from Coigach to the markets of Tain, Dingwall and Contin, and from the extreme north-west to the crews of the herring vessels which visited the coast from the south[19] but these were only small breaks in the routine of subsistence production. Of greater value perhaps was the barley sold to the distillers. It was on the peripheral regions that this market was of greatest importance. Easter Ross, where there was a grain surplus and a concentrated industry, is outside our area of study, but it may have drawn barley from the interior, and Kintyre and Islay also showed the importance of the distillery.[20] In the more remote parts there was little barley to spare and it was to the illicit stills that it would go. Thus, only in Kintyre with its dairying, its distilling and, incipiently, its export of potatoes, and in Islay with its horse-breeding, its grain surplus to come, and its distilling, was there any substantial deviation from the traditional dependence on the sale of one farm product—cattle.

This was, about the middle of the century, not only the sole cash product of the farm but also, by all the evidence, the staple of all commerce. Cattle sales, apparently, would meet the rent, probably

[17] Breadalbane Collection, Reference Book of Farms (1769).

[18] John Henderson *General View of the Agriculture in the County of Sutherland* (1812), p. 107; Macdonald, *op. cit.*, p. 622.

[19] John Smith, *General View of the Agriculture in the County of Argyle* (1805), p. 252; Forfeited Estate Papers, Gen. Man., No. 93: Pennant, *op. cit.*, II, p. 364.

[20] *O.S.A.*, XI, p. 296; XIII, p. 522; Smith, *op. cit.* p. 329; Pennant, *op. cit.*, II, p. 221.

pay the meal bill and possibly leave a small surplus for other essentials. The small estate of Barrisdale, in western Inverness-shire, may serve as an example. There, twenty-four tenants, gathered in ten farms, were selling annually sixty-eight cattle, from which they made £150 13s.; of this they spent £53 16s. on meal and £79 3s. 8d. on rent. In the interior districts of Stratherrick, Clunie, Strathgartney and Strathyre rents amounted to about one half the presumed earnings from the sale of stock; if the meal bill were here also smaller than the rental—and in districts of greater arable resources such as these it may be presumed so—there would again be a small surplus. There was a similar position in the western coastal districts of Coigach and Kinlochmoydart.[21]

After 1750, however, the forces of price change and industrial expansion began to break down the traditional and almost exclusive dependence on pastoral husbandry. The most notable expansion was in kelpmaking.[22] Under the spur of increasing prices this industry, which absorbed the seasonal labour of peasants of all grades, expanded with great rapidity. By 1810 it had reached the peak of its expansion and had wrought great changes not only in the detailed affairs of small holders of land but also in the fundamental balance of land and people. Its hold was greatest in the far western chain of islands—the Long Island—and particularly in the more southerly members of that group. In these main kelp islands almost the whole of the adult population was drawn in, there being no specialised or landless class of kelping labourers. Under favourable conditions a family might make three or four tons in the season, for which they would be paid something less than £10. Before the price inflation of the first decade of the nineteenth century (which benefited sellers of cattle but not kelpmakers) very few tenants would make as much by the sale of cattle. (The growing predominance of kelp earnings within peasant households was helped by the decline of individual cattle stocks on the main kelp islands.) Lewis and Harris produced less kelp per head of population but landholders, at least in patches, were equally universally engaged; in Harris, for example, kelp labourers, no less numerous relatively to total population than in the islands to the south, produced and earned considerably less per head. In such islands kelp might equal but would not outweigh agriculture as a source of income; the cottar might depend predominantly upon kelp, but the main run of tenants would still make more by the sale of cattle. Among the

[21] Forfeited Estate Papers, Gen. Man., Nos. 5, 91, 116, 136, 138.

[22] For details and sources on the rise of the kelping industry, see M. Gray, 'The Kelp Industry in the Highlands and Islands,' *Economic History Review*, 2nd Series, Vol. IV, No. 2, pp. 197-210.

Inner Hebrides the industry was more patchily distributed; although in parts of Skye and Mull it had something like the same weight, relative to agriculture, as it had in the more westerly isles, over the whole of any one of these larger islands the returns from the sale of kelp would be far less than those from the sale of cattle. Along the mainland seaboard kelp fades almost to insignificance, although there may have been small and dispersed clusters of tenants largely dependent thereon; certainly in no single mainland parish was kelping of anything like comparable importance to pastoral husbandry.

The development of the dispersed and erratic fishing industry—again a peasant by-employment and one engaging the attention of a personnel at least as numerous as did kelp—is more uncertain. The herring fishing of the coast, conducted entirely from boats of limited range, depended on the chance, occasional and brief visits of the spawning herring to the lochs. Locally, catches fluctuated grievously, and in such a way as to obscure any general trend. ' The migration of the fish from their northern retreat is regular: their visits to the Western Isles and coasts certain; but their attachment to one particular loch, extremely precarious,'[23] And, while nearly every coastal farm could provide at least one boat for this fishing, the commerce in herring, depending solely on the disposal of the fish to the merchants of the Clyde and hanging by a series of fragile links, was geographically confined. In two main areas, however, herring fishing for the market was extensively developed: in the lochs (chiefly Loch Fyne) within the Kintyre peninsula, whence the herring could be sold ' green ' (uncured) to ' adventurers residing in towns on the banks of the Firth ',[24] and, secondly, along the coasts of Skye and mainland further north, whence the herring might be sold to sloops that came from the Cylde, to local curing houses, or to ' busses ' (decked vessels operated from the south). The Firth of Clyde fishings were ' very extensive and pretty regular'.[25] Considerable fleets of boats—there were 600 to 800 in Loch Fyne—each equipped at some expense, served to remunerate the surrounding peasant communities with earnings as widely diffused and as considerable as those derived from agriculture.[26] The parish of Saddell and Skipness, for example, had about 300 men (in a total of about 270 families) engaged in the herring fishing; each would make from £6 to £15, or even £20, in the season.[27] In the north-west, in spite of the commercial effort, fishing was a much more

[23] Pennant, *op. cit.*, II, p. 374.
[24] Melville Papers, National Library of Scotland, MS. 640, f. 232.
[25] *Ibid.*
[26] *Ibid.*
[27] Smith., *op. cit.*, p. 331.

precarious stay; markets were more distant, boats less well equipped, the attentions of the curers more sporadic and the movement of the herring into the lochs more erratic. At the end of the eighteenth century some few communities, to judge by the meagreness of their holdings of land, were depending predominantly on fishing, but generally the sea provided, besides extra subsistence, only an uncertain addition to the income of the peasant. White fish (cod, ling and tusk) were more regularly caught, more easily cured, and more certain of a market. This section of the industry, then, had come to rest in two main centres—Lewis, where the developing merchant class of Stornoway dealt with the catch, and Gairloch, where the proprietor made arrangements for the purchase of the catch. But even here, while the earnings of the fishers were steady, they no more than equalled the cash return of husbandry.[28]

The development of this traditional industry through the second half of the eighteenth century is difficult to trace; local fluctuations tend to obscure the general trends. But there are indications. The export cure, for which the entire supply of fish at this time came from the westerly grounds, was increasing; the busses which, although owned by southern capital and fitted out in the south, operated mainly in the north-west and bought some of their fish from the local fishermen, were, through many year-to-year fluctuations, expanding their landings; after 1780 capital began to show signs of moving to the north-west to open up curing establishments;[29] and in the last decade of the century Caithness began the sensational expansion which not only established the industry in the county but also attracted men and boats from the north and west coasts. On the whole, then, it seems that more was being made of the herring fishing, even the dispersed local fishings, at the end than at the middle of the century.

Although one or other of these industries of kelp and fishing would contribute something to most of the households along the western seaboard, they could not touch the great, though diminishing, section of the Highland population, which lived in the long straths east of the mountain spine of the country. For the people of this area, however, there was some compensation in the expansion, through the eighteenth century, of the domestic linen industry. Domestic spinning, off-shoot of weaving concentrated in Lowland centres, lapped over the Highland line mainly in the county of Perth, but some yarn was spun also in

[28] As at Gairloch (*Third Report of S.C. on the State of the Fisheries* (1785), p. 140).

[29] *S.C. on the State of the Herring Fisheries* (1799), pp. 235, 278, 294-5; David Loch, *Essays on the Trade, Commerce, Manufactures and Fisheries of Scotland* (1778), II, pp. 186-7.

the eastern districts of Ross and Inverness, in Dumbartonshire and in Argyllshire (particularly in Islay).[30] North of Islay, on the west coast, there was little or nothing of this trade, and some of the more easterly stretches of the Highlands, such as Strathspey, had no share in the industry. Where spinning was an established activity, however, the contributions of the spinner to peasant earnings might be of decisive weight. In the parish of Moulin (Perthshire), where the spinning of linen yarn was said to be the staple of the country, all the women would be thus occupied for twenty-one weeks in the year, earnings being about 4½d. per day.[31] Thus the household with two spinners would make as much by spinning (£4) as the average tenant in those parts was likely to make by the sale of cattle.

All the interacting factors of peasant livelihood were combining to produce, through the second half of the eighteenth century and up to 1815, a continuing increase of total money incomes. Cattle prices at least doubled between 1750 and 1790, and doubled again by 1815: meanwhile the total cattle population increased as, with the increase of population, the number of peasant holdings expanded (the fall in stocks per family being certainly less than proportionate to the increase in the number of families). Aggregate money incomes from the sale of cattle increased more than proportionately to price, individual average incomes probably rather less than proportionately. The rise in kelp prices was even more dramatic and, although the greater part of the windfall gains after 1790 was picked up by the middlemen (proprietors of land), an expanding product, at stationary piece rates, kept earnings moving upwards. The rewards of fishing, liable to catastrophe and reaching an uncertain proportion of the total fishing population, were also (probably) tending to increase. The output of linen goods, and presumably the yarn of the Highland areas, was also steadily on the increase till the nineties.

By 1815 the economy was poised with population, arable acreage, animal stock and money incomes (individual and aggregate), all greater than they had been half a century before. Yet it was not notably an era of improving peasant standards, in spite of the fact that the main article of purchase, meal, proved much stickier in price than other agricultural products. Demographic reaction was sharp, but not immediately serious because the increased cultivation of the potato was increasing the subsistence yield of the soil. More immediately compulsive was the action of the landlords: increased rents swept away the greater part of the new peasant surplus. The increasing rentals

[30] Stampmaster's Accounts, Board of Trustees, No. 95.
[31] *O.S.A.*, V, pp. 61-2.

of the later eighteenth century are well-worn evidence; they stemmed from several sources, from sheep farming and from industrial earnings, but much was taken also from the smallholder pursuing a traditional husbandry, and there seems little doubt that by 1815 rents were stretched to take a larger proportion of the cash return of husbandry than had been common under the old order. Industrial earnings were also tapped. Tenants in kelp estates paid for the situation rather than the agricultural potentialities of their holdings, and had no hope of paying the rent except by kelp earnings.

Thus was the economy geared to the new conditions, each region with its characteristic, and distinctive, equilibrium based on higher incomes, increased rents and moderately expanded expenditures. All over the easterly straths the main dependence was on cattle, but in Perthshire linen spinning, spreading its extra earnings among the small farms, held an almost equivalent position; in southern Argyll an active and steadily profitable fishing probably earned more than agriculture; in Kintyre a more variegated agriculture, together with the distilling and commercial bustle of Campbeltown, overlaid the simple pastoral economy; northwards from Kintyre and as far as Skye, cattle rearing was only slightly diversified by scattered kelping establishments and by a desultory fishing; around the coasts of Skye and northward to Cape Wrath the still predominant cattle-rearing was generally mixed with fishing, with an occasional local preponderance of the latter; in Lewis and Harris kelping, fishing and agriculture were mixed, with in some localities kelp predominant over agriculture and in others fishing challenging but not surpassing agriculture; and in the more southerly islands of the Long Island chain kelping earned far more than husbandry, with fishing of importance only in Barra. In all cases these activities were developed on the basis of the small arable holding, used for subsistence; no specialised groups of industrial workers appeared.

III

The expansion of money incomes—but not the growth of population—halted, quite abruptly, in 1815, and there followed a price fall of most painful consequence for the Highland peasant. The 'redundant population' which was so much discussed in the ensuing decades had been produced as much by the retraction of earning power—a retraction caused by situations in distant markets—as by the simple increase of population. In the time of rising prices population had increased without, immediately, straining the economy, but it had

produced a poise that could be held only on favourable exchange terms (of Highland with Lowland produce).

The most catastrophic price fall was in kelp, the manufacture of which, by the thirties, showed no profit (the price having fallen from over £20 per ton to £3 and under).[32] Along the mainland coastlines and, except at a few points, throughout the Inner Hebrides, production ceased completely, with loss both to tenant and to landlord, but in the Long Island, and particularly in North and South Uist, proprietors continued to give some work to the kelpers (although as middlemen they made no profit) in order to extract a modicum of rent for the land. Formally, then, the wages of the kelpworkers who struggled on —they were now concentrated largely in the southern half of the Long Island chain, with a few isolated remnants to the north—did not markedly decline; nor, in the main kelp islands, did employment contract much. In fact, however, no money entered the hands of the kelpers because of their work; they simply laboured for their land by services in the making of kelp which would be at the disposal of the landlord. The effects of the more gentle fall in the price of cattle—from a peak of about £6 for the three-year-old of the ordinary tenant to the trough of between £3 and £4 for the same type of beast—if locally less catastrophic, were serious for a peasantry being thrust back more completely into exclusive dependence on the land (and on cattle as the main cash product), and they were felt everywhere throughout the Highlands. Fluctuations and general trends in the fishing industry are harder to discern. Some centres undoubtedly lost a former prosperity, but such fluctuations of fortune were an old story and there had been compensating improvement in other localities. To the south the fishermen of Argyll, improving their equipment, continued to make a steady living, while in Caithness a developing industry was thrusting its influence along the north coast. Thus, although in a bad year the landings at west coast ports might fall below the normal landings of the eighteenth century, they were as often as good or better; on an average of years there had been no apparent decline in the physical product of the sea.[33] Nor did the price of the cured fish fall. By the forties linen spinning had quite gone from its Highland centres,[34] but these centres—Perthshire and Islay—were just the districts where agrarian reorganisation had given

[32] Gray, *loc. cit.*

[33] See annual reports of the Herring Fishery Board.

[34] The reports in the *New Statistical Account* (1835-41) on the old linen-spinning parishes either do not mention the activity at all or comment on its disappearance.

the land a new reserve of power to carry along its farmers and wage-earners in moderate security.

The fall in prices and incomes could not, if only because of the intervening increase of population, restore the pre-inflationary situation. Even though the broad base of subsistence production held firm, the money economy had eaten more deeply into traditional ways. The greatest change was in textiles, where the factory-made stuffs from the south were increasingly replacing the traditional homespun. In the eastern Highlands, by the forties, the local subsistence industry had been destroyed, and even in more remote regions the taste for the new cloths, carried by the young workers who went seasonally to the Lowlands, was developing. In the manufacture of shoes and household wares and in methods of building, except along a narrow strip accessible to Lowland influence, there had been little change. The equipment of fishing boats, except in Argyll, showed no apparent improvement. But in agriculture there was considerable new expense arising. Iron ploughs, harrows and other implements, more expensive and more dependent on the skilled workmanship and the materials of the Lowlands, had completely driven out the cumbrous wooden implements of local manufacture (except where the use of the cas-chrom persisted) and, with the widespread improvement of roads, carts were multiplying in number. Even coal was beginning to be used, if only by a narrow circle of superior tenants. Almost certainly, the conventional manner of living and the normal level of agricultural equipment demanded, by 1850, greater money expenditure by the ordinary tenant.

Even more serious for him, however, was the stickiness of rents. If they fell at all, it was but slightly, and certainly not proportionately to the fall in the price of produce. The tenant was caught between relatively fixed obligations and falling money income. That the ordinary tenantry was not swept from the land seems to have been due simply to the practice of allowing rent to act as the mere residual of other payments. On some estates nearly all tenants fell into arrears, and an indebted peasantry surrendered many of its rights of independent action to the landlord creditors; they laboured for their land, perhaps gave up some of their capital stock (in the form of cattle), accepted the necessities of life as an item in the embracing account between tenant and landlord, and lost any chance of enjoying a freely disposable income or of accumulating capital. Sometimes cancellation of arrears or temporary remissions would cut through the tangle, but nothing was done on a sufficiently wide scale to cast off the continuing incubus of indebtedness.

Although price and industrial changes since 1815 proved almost uniformly unfavourable to the Highland peasant, there were opportunities of alleviation and even improvement. It was over the easterly parts of the Highland plateau that these opportunities were most firmly seized. In Perthshire and Argyllshire, and in some of the straths further north, improved methods of cultivation, a more economic arrangement of holdings, relief from the pressure of population by migration to the Lowlands, and a demand for labour from the bordering Lowland farms sufficient to maintain the lesser holders of land, had thrown up a new agrarian order and a viable economy. But in the north and west there was an unrelieved concentration of adversity. By 1850 even the greater peasants of this area were entangled in the net of indebtedness and precarious subsistence.

The small tenants there, comprising over 90 per cent. of all holders of land, still depended universally, and sometimes solely, on the sale of cattle for their money income. Although some had taken to commercial sheep-rearing, probably more than half of all small tenants had now no sheep at all, and only a tiny minority made more by the sale of sheep than by cattle.[35] On the other hand, with increase of population and with restriction of pastures in favour of the big sheep farmers, the small tenant's cattle stock had on the average dropped (as well as each beast losing value). The average crofter—and with the equalisation of holdings his case was certainly typical of the broad majority—would sell no more than one beast in the year, making thereby between £3 and £4,[36] but for the use of his holding he would have to pay probably about £5. The majority of tenants were now unable to pay even the rent of land out of sales of cattle, while sheep sales would only occasionally fill the gap and industrial incomes were a shrinking or an uncertain aid. Most peasant households had need of subsidiary incomes, the sources of which varied, as they always had done, from place to place.

Fishing was now the greatest standby. The tenantry would participate to a degree varying from place to place. Most widespread was the activity of the peasants of Wester Ross, where characteristically 'almost all householders are small lotters and fishermen, with the exception of a few mechanics'.[37] But with the supply of fish uncertain (for the under-equipped west coast fisherman could never

[35] See the numerous examples of the stocking of croft holdings cited in Sir John M'Neill's *Report to the Board of Supervision on the Western Highlands and Islands* (1851).

[36] See again many examples in the M'Neill *Report*; rents paid by the average crofter may also be computed from the statistical tables contained in this report.

[37] *Poor Law Inquiry: Scotland* (1844), Part II, p. 440.

escape from the limitations of the loch fishing), with the attentions of the curers wavering, with the profit margins of personal curing and sale narrow, the gains of the individual fisherman were seldom more than meagre; not uncommonly £1 would be the money reward of a season's fishing, and £5 was a windfall. In parts of Skye participation was equally wide and the gains equally uncertain. In Lewis, even in the main fishing parishes, no more than half the population would share in the steadily remunerative white fishing, and further south little was made of fishing of any sort (except in Barra which retained its pre-eminence). Along the north coast a population much increased since 1800 was making more of the fishing than did the men of the west coast. 'As respects the inhabitants of the north coast generally, both their disposition, perseverance and success is greater than elsewhere in fishing.'[38] But perhaps not more than half of all families in these parishes had any share in the fishing and of these only a minority can have had any part in the heavier craft which went to the Wick fisheries and which accounted for 90 per cent. of the gains.[39] In Argyllshire, at the other extreme of the Highland coastline, progressive improvement in equipment and craft was increasing an earning power that had always been steady, and was detaching the fishermen, now small capitalists, from their traditional dependence on the soil; this influence did not, however, penetrate north of Kintyre.

Fishing, except in the most favourable conditions of season and place, could scarcely fill the gap between the earnings of husbandry and the monetary obligations of the tenant, and an unstable equilibrium was reached only by the widespread, and apparently increasing, practice in crofting households of sending at least one member of the family to work seasonally in the Lowlands. Agriculture, the traditional standby of the migrant, still claimed its quota of labourers, particularly in the large farm areas of the Lothians. But to an increasing extent, men and women, particularly from the more northerly Highlands, were moving to the expanding fisheries of the east coast, there to find employment for the six weeks of the summer season. The reward for such a spell would be between £4 and £6,[40] as much as a crofter was likely to make from his holding and more than the home loch fishing was ever likely to give. In some districts, every family would send, on the average, one member in search of such work, but in others only one family in four would make anything in this way.[41] It is clear,

[38] *Report to the Central Board for the Relief of Destitution* (Edinburgh Section, 1847), p. 65.

[39] For example, in the parish of Eddrachillis, *New Statistical Account*, Sutherland, p. 131.

[40] *S.C. on Emigration, Scotland* (1841), Q. 3247.

[41] M'Neill *Report*, XII, App. A, pp. 59, 87, 92, 107.

however, that such earnings were for many families the saving opportunity, the most secure and the most remunerative of the sources of income.

Yet the addition of all the incomes that came into the crofting household would at best no more than stretch to cover fixed obligations and basic necessities; a drop in cattle prices, the absence of herring from the loch, partial failure of the grain or potato crop, would pull the tenant into debt, and once there he would find it hard to recover. Arrears and debts of many sorts would drag on for years. The effect was to destroy the economic independence of the peasantry, to reduce them from independent farmers to little more than labourers with small lots of land, and labourers moreover who were remunerated in kind rather than in money. Landlords and tacksman had long been dealers in meal, kelp, herring and the ordinary necessities of life, and in their relations with the tenants as they now developed they would supply materials (for fishing) and meal—besides, of course, an allotment of land—and would extract in return herring, kelp or labour services, simply by entry in a comprehensive account in which the tenant was generally a permanent debtor; in fact landlords were extracting the labour services of a dependent population in return for land and the minimum of subsistence.

It is possible, perhaps, to over-emphasise the extent of this collapse, for contemporaries were wont to stress the pathological rather than the normal, but in the kelp islands at least the retreat from peasant independence and the money economy was an old tale. In the fishing districts too might be found the 'system by which the fish caught either became the property of the factor with whom they were in arrear of rent, or of those who had supplied them with meal, or of the merchant to whom they were in debt'.[42] But the cattle trade ran more freely. It seems that the more easterly and southerly estates, where the productivity of agriculture had increased, where much of the land was in the possession of more substantial peasants, and where the complications of kelp and fishing were absent, worked as systems of free and independent farmers; that along parts of the coasts of the north-west and of Skye, rents would still be paid in money; that in parts of the same area there had been relapse into the encompassing system of payments in kind; and that in the Outer Isles debt, labour services and direct provision of subsistence by the landlord were common.

Such—not to speak of the embarrassments of landlords which culminated in the selling of so many old Highland properties—were

[42] *Relief Board Reports* (Third Report, Edinburgh Section) (1849), p. 271.

the difficulties of the peasantry. Cash farming and the money economy cannot of course be divorced from the subsistence system which, it should never be forgotten, still provided the chief basis of existence; the demand for meal, for example, was conditioned by the subsistence yield of the arable. But perhaps enough has been said to show that 'over-population', the redundancy which was to be shown up so grieviously in the potato famines of the forties, was not simply a matter of people having become too many for the area of land on which they lived. Perhaps indeed a smaller population would have been able to live more comfortably, with a sufficiency at least of food, but the relapse from the 'balance' of 1800 had been caused almost as much by the enforced cut in money incomes as by the increase of population over a limited area of land.

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SOME ECONOMIC ASPECTS OF THE UNION OF PARLIAMENTS

AT the time of the Union of Parliaments in 1707 England and Scotland had been joined in a dynastic union for a hundred years but were separated by more than three hundred years of economic development. There had been no fundamental change in the Scottish economy since the Middle Ages. The methods of agriculture were primitive; hardly any manufacturing industries had been developed; raw materials and foodstuffs were exported, manufactures and luxuries imported; overseas trade still followed the routes which had been familiar in the Middle Ages, and until nearly the end of the seventeenth century hardly any Scottish merchants ventured out of European waters. Scotland was, in short, a backward country, and that this had some sort of bearing on the causes and consequences of the Union of Parliaments has long been a commonplace among historians. The relevance of economic factors has, however, too often been left vague and undefined. It is the purpose of this article to reconsider how far the events leading up to the Union were shaped by Scottish economic interests, or economic policy, and to assess the influence of the Union on certain aspects of Scottish economic development in the eighteenth century.

I

Scottish Economic Interests and the Negotiations for a Union

On this point there are conflicting views among historians. On the one hand, it is said that 'the Scots since the Revolution had set their minds upon obtaining for themselves a share of the world's trade. They found that this was impossible without English help, and that they could not force free trade from England for any less return than their assent to an incorporating union.'[1] 'Incorporation as the price of free trade is the secret of the Union . . . The vindication of the Scottish representatives lies in the fact that they could get free trade on no other

[1] Theodora Keith, 'The Economic Causes for a Scottish Union,' *Eng. Hist. Rev.*, XXIV (1909), pp. 59-60.

terms."[2] On the other hand, it is argued that although 'much has been said about the connection between the Darien Scheme and the legislative union of 1707, (yet) the Union was not, in the first place, the result of economic causes . . . the driving force of the Union negotiations came from England, and no English government, and no English party, was interested in the prosperity of Scottish merchants'.[3]

This issue can be resolved by invoking the time factor. Taking a very long-term view, the pressure in favour of a union, from the time of Edward I until Cromwell, had come from the side of England, and economic interests provide a plausible explanation of the assent at last given by the Scots to a union which they had resisted with arms for centuries. In the more recent past, from the union negotiations of 1667-8 until those of 1702-3, pressure in favour of a union had undoubtedly come from the Scottish side, and the motive was commercial. For several decades the Scots attempted to gain access to the English colonial trade, from which they had been excluded by the Navigation Act of 1660, and were ready to consider parliamentary union as the price they would have to pay. After 1703 the situation altered once more—the Scottish urge for commercial expansion had diminshed as a result of the successive disasters of the Africa Company, and the pressure for a union, on grounds of political and military security, came once again from England.

After the Restoration, the urge for trade with America, Asia and Africa was a new factor in Scottish economic life. There were many reasons for the change. The recurrent English wars of the seventeenth century, with the Spaniards, the Dutch and the French, who were, together with the Baltic ports, Scotland's most important customers and sources of supply, made it necessary to seek new channels of trade in place of those which had become ruined by constant interruption; policies of protection for industry, adopted in Scotland and on the Continent alike, reduced the opportunities for exchange between them; the expansion of manufacturing industries, and the export of their products in exchange for tropical goods, was ceaselessly advocated by Mercantilist writers; Dutch and English wealth seemed to be based on their colonial, African and East Indian trade, and their methods, however inappropriate to Scotland's economic structure and stage of economic development, invited imitation; and finally, for a country plunged in poverty and urgently seeking the means for greater prosperity, commercial policy then, as always, seemed to be the easy solution, the line of least resistance—much easier than attempting to raise

[2] J. Mackinnon, *The Union of England and Scotland* (1896), pp. 227, 232.

[3] R. S. Rait, *History of Scotland* (1929 ed.), p. 213.

productivity per head on the land and in a multitude of economic activities.

After the failure of attempts to gain access to the English colonies and plantations, the Scots launched the Africa Company and the Darien Scheme, which combined in one enterprise two methods which had been successfully employed by the English and the Dutch in their overseas ventures—the joint stock company and colonisation. The ingenuousness of the venture is almost incredible. With only incipient manufactures of her own, Scotland sought to compete in the markets of the new world with all industrial Europe; in desperate need of capital for development at home, she devoted nearly half of what was available to the Africa Company[4] and exported most of that overseas; without ships of her own, she sought to compete in the world's carrying trade with all the leading maritime nations; and without a fleet of any kind for its protection, she sought to take possession of a colony in the heart of an area in which rival empires were habitually locked in combat.

By about 1703 the successive disasters at Darien and in the other ventures of the Scottish Africa Company had at last disillusioned the Scottish merchants, statesmen and public about the easy wealth to be gained from colonial trade. They still vigorously asserted their *right* to this trade,[5] but apart from the last dispirited and unsuccessful effort to salvage some of the Company's losses by hiring the English ship *Annandale* for the purpose (for they no longer had any ships of their own), all practical attempts to engage in the trade were virtually abandoned. Negotiations for a union which would give Scotland access to the English colonial trade had once again proved fruitless, and after this little more is heard of pressure for union from the Scottish side. Trade with English, or any other, colonies had ceased to offer attractions.[6] Defoe noted with surprise that the Union was opposed by the Scottish merchants, who saw in it little more than an increase in customs duties and the ruin of their trade with France.[7] In a memorandum against the Union to which twenty-four of the Royal Burghs subscribed, it was argued that Scottish trade would suffer from the Union, since the duties and commercial regulations enforced under the Treaty were designed in the interests of England, which were at

[4] W. R. Scott, *New Mills Cloth Manufactory, 1681-1703* (1905), p. xlv.

[5] *Acts of the Parliament of Scotland*, XI, p. 109.

[6] Bruce, in his *Report on the Union*, states that at one stage the Scottish Commissioners of 1702-3 were ready (even then) to modify their commercial demands to a mere four permission ships per annum to the English plantations; but he does not give his authority for this statement. See John Bruce, *Report on the Union of England and Scotland* (1799), p. 396.

[7] Daniel Defoe, *History of the Union between England and Scotland* (1786 ed.), p. 221.

variance with the interests of Scotland.[8] Edinburgh was against the Union, and even the representative of Glasgow, which was more inclined to welcome the prospect of trade with America, consistently voted in Parliament against the provisions of the Treaty. When William Seton spoke in the Scottish Parliament in favour of the Union, and stressed the commercial advantages which would ensue, he was speaking not to the converted but to those who had lapsed from their former belief in the value of colonial trade.[9] The ' communication of trade ' was still, for the Scots, a necessary condition of union, but no longer a powerful inducement.

When a new Scottish Parliament met in May 1703 there was nation-wide indignation against England for what was regarded as a scandalous and ruthless opposition to legitimate Scottish ventures. Parliament passed a series of Acts tending to a separation of the Crowns and to friendship with France, and this at last moved England in the direction of union. There was danger of an Anglo-Scottish war, which would imperil both the Hanoverian succession and the safety of England against invasion, and union was now regarded in England as a measure necessary for national security.

In July 1703 Godolphin wrote to Seafield, the Scottish Lord Chancellor, warning him that the passing of a recent Scottish Act could hardly fail to lead to war between England and Scotland, and threatening that Scotland would be the chief sufferer in this event. To avoid war he urged ' the necessity of a speedy union between the two nations: which is a notion I am sorry to find has so little prevalency in the present Parliament of Scotland '.[10] During the next two years Scottish statesmen courted the danger of war with England,[11] and it was with war as an alternative that Scottish Commissioners once more resumed negotiations for a union in 1706.

When the terms of the Treaty of Union had been negotiated, the supporters of the Treaty in the Scottish Parliament laid emphasis on the economic concessions it contained in favour of the Scots, and used this argument skilfully against an unconvinced but weakening Scottish opposition. The strongest opponents of the Treaty included many who had been loudest in support of the Darien Scheme and had asserted most vehemently Scotland's need for colonial trade. Opinions had changed since 1703, but their minds were too confused, or their pride too precious, to permit them at this juncture to recant and admit that

[8] *Records of the Convention of the Royal Burghs of Scotland*, IV, pp. 400-1.

[9] Pamphlet, *A Speech in Parliament the Second Day of November, 1706*, by William Seton of Pitmedden, Junior.

[10] *Stair Annals* (1875), I, pp. 380-1.

[11] See *e.g.*, *Correspondence of George Baillie of Jerviswood, 1702-8* (1842), pp. 22, 28, 122.

they had been mistaken. Their dilemma was exploited by supporters of the Treaty, and was one of the reasons why it was successfully carried through Parliament. The Earl of Mar wrote to Sir David Nairne, with a suggestion of glee, on 19th November 1706: ' You nor your friends with you need be surprised at nothing the opposing party does, after their debating against the 4th article, which is the communication of trade; and this they did today in the House ', and again on 21st November: ' Fletcher was so angry tonight when he saw the article of communication of trade carrying in the House, that he run out of it; but since they voted against this article you can be surprised at nothing afterwards '.[12]

There was a powerful body of opinion in Scotland in favour of a federal rather than an incorporating union. Some of the Scottish negotiators were themselves inclined to the federal solution but abandoned hope of it in the face of English intransigeance.[13] But it was largely the fault of the Scots themselves that the federal solution was now politically impossible. Their zeal for a colonial trade, which they found too late was misguided, had brought their relations with England to the verge of war; and in more peaceful conditions England might have accepted a federal solution. Scottish statesmen had not only based their policy on false economic premises but had also, through mistaken diplomacy, created a situation in which compromise was impossible, and in which they, the weaker party, were bound to yield to the dictation of the stronger.

II

The Influence of the Union on Scottish Economic Development

The most important result of the Union was that the possibility of war between England and Scotland was removed; and the economic advantage to both countries of an era of peace, security and internal stability would be difficult to exaggerate. It is reasonable to maintain that security against invasion, the expansion of the British Empire, and the progress of the Industrial Revolution in Britain, would not have been possible in the circumstances of the eighteenth century without some form of union. This is the real case in favour of the Union from both the Scottish and the English point of view.

There are, however, certain claims in favour of the Union which need to be examined more critically. The Union, it is said, ' threw open the vast colonial markets which the sister kingdom had so

[12] *Hist. MSS. Comm., Earl of Mar and Kellie* (1904), pp. 328, 330.
[13] *Carstares State Papers* (1774), pp. 743-4.

heroically built up during the preceding hundred years. Scotland, with a mere handful of ships and no native industries at all comparable with the English woollen industry, was presented with boundless opportunities, and infinitely poor as she was she rose to the occasion.'[14] Dicey and Rait were of the same opinion.[15]

One objection to this view is that economic development in Scotland could make little headway without improvement in agriculture, which was much the most important industry in terms of numbers employed. Without this there could be little increase in real income and the domestic market could not expand. And the expansion of colonial trade had little relevance to the progress of Scottish agriculture. This is not merely wisdom in retrospect. 'The stock for foreign trade in every country is its product and manufacture,' wrote Lindesay, Lord Provost of Edinburgh in 1736; and 'our land should be improved to the utmost . . . that we may have provisions in plenty, to maintain as many hands as may be employed in manufacture'.[16]

Turning to manufactures, the only industry about which accurate information on output and exports is available is the linen industry, which was subject to official inspection and was in receipt of export bounties. But this, as it happens, is the industry which deserves most attention, since it was much the most important manufacture in Scotland until it was displaced by cotton at the end of the eighteenth century. There is no evidence of progress in the linen industry until twenty years after the Union, when the Act for Manufactures and Fisheries provided subsidies and encouraged the improvement of techniques of manufacture. Nor is there any evidence that access to the colonial market as a result of the Union was the chief impulse to the expansion of the industry. That is not the conclusion which the following figures suggest:[17]

	A Quantity of Linen cloth stamped in Scotland (000 yds)	B Quantity of Linen cloth exported from Britain (000 yds)	C Quantity of Linen cloth imported into Britain (000 yds)
1728	2,184		
1743	5,061	53	
1760	11,748	1,414	18,800 (1762)
1771	13,466	4,411	28,200

[14] H. Hamilton, *op. cit.*, p. 3. Prof. R. Pares expressed a similar view in an address to the recent Franco-British Conference of Historians. *The Scotsman*, 21st July 1954.

[15] A. V. Dicey and R. S. Rait, *Thoughts on the Union between England and Scotland*, (1920), pp. 317-8.

[16] Patrick Lindesay, *The Interest of Scotland Considered* (1736), p. 64.

[17] The sources are as follows:
Column A: A. J. Warden, *The Linen Trade* (1864), pp. 477-80.
Column B: *Ibid*, p. 666.
Column C: D. Macpherson, *Annals of Commerce* (1805), III, p. 516.

No separate figures are available for exports of linen cloth of English and Scottish manufacture. But even if *all* British exports had been of Scottish manufacture, and *all* of that to the colonies, the figures indicate that they accounted for only a small part of the increased output in Scotland before 1760. Increased exports to the colonies may have been responsible for the (much slower) expansion in output after 1760, but on the whole the domestic market for linen cloth in Britain was obviously much more important than the export market. Column C provides confirmation that this was so.

In the middle of the century the Scottish linen industry, so far from responding to the inducements of colonial markets, had difficulty in entering them. German and Austrian manufacturers found it profitable to send linen cloth to English ports, from which it was shipped to the colonies. Drawbacks were paid on these re-exports, and Scottish efforts in 1736 and 1742 to have the drawbacks removed were unsuccessful.[18] Scottish manufacturers may well have wondered at this time what advantage they had gained from the Union. It was only when bounties were paid on British linen exports, from 1742 onwards, that the export trade rapidly expanded. Information about other Scottish manufactures is scanty, but there seems little reason to suppose that in other cases the colonial market was of much greater importance.

Scottish shipping and commerce expanded greatly in the course of the eighteenth century, and much of it was directed towards the American colonies. But there are two considerations which suggest that as a causal factor in Scotland's economic development the opening of the colonies to her shipping and commerce was of subordinate importance:

(*a*) For several decades after the Union the expansion of shipping and commerce was very slow. It was only in 1718 that the first ship owned in Glasgow crossed the Atlantic. From then until 1735 there was little progress, and for this the Glaswegians placed the blame on what they regarded as vexatious customs regulations enforced at the instigation of English ports. In 1735 there were eleven Glasgow vessels engaged in overseas trade, five to America and the West Indies, and six to Stockholm, Holland, Gibraltar and the Straits. From then until 1750 trade expanded, but slowly, and it was only in the third quarter of the eighteenth century that a rapid expansion of trade with our colonies took place.[19] The rate of change in such a case provides a clue to economic causation. When there is a favourable change in commercial policy, or an opening of new commercial opportunities,

[18] H. Hamilton, *op. cit.*, pp. 84-5.
[19] J. Gibson, *History of Glasgow* (1777), pp. 206-12.

one would expect that the effect on economic development would normally be fairly rapid. But since development in Scotland was delayed, not merely for years but for decades after the Union, one must suspect that the real cause of progress, when it came, was different. It must have been lack of power to produce, not lack of opportunity to sell, which was the major obstacle to development.

(*b*) The greater part of the trade which developed with the colonies was carrying trade, in which the importing and re-exporting of tobacco was of chief importance.[20] In 1771, which was a peak year of Scottish overseas trade before the American War, total exports were valued at £1,857,000, of which only £503,000 (to all destinations) were British goods, and the remainder re-exports.[21] The carrying trade was, of course, of value in itself, but the figures show to what a limited extent the expansion of trade reflected the growth of a market for Scottish products in the colonies. In 1771 the value of total exports to North America from Scotland was £376,000, of which British goods accounted for only £261,000, and according to Knox a large proportion of the exports of British goods from Glasgow was normally of English products and manufactures, as well as Scottish.[22]

Since we are considering the effect on the Scottish economy of access to the colonies, what happened after the American War is, strictly speaking, irrelevant, but it is sometimes maintained that the profits of Glasgow's tobacco trade, which vanished after 1775, were an important souce of capital for the future development of the cotton industry. This may have been so, though to what extent it is difficult to say. In other respects the loss of American trade did so little injury to the Scottish economy as to suggest, not merely that Scotland showed remarkable ' resiliency ' at this time,[23] but that the importance of the American trade for the Scottish economy as a whole was not so great as might be supposed. The carrying trade was ruined, but exports of British goods from Scotland rose from £503,000 in 1771 to £767,000 in 1780, and to £914,000 in 1791. Linen cloth production in Scotland fell from a peak of 14·8 m. yds in 1777 to 12·9 m. yds in 1779, but then expanded steadily to 19·1 m. yds in 1784.[24]

In 1783 the American trade was laid open to all the world. ' Thus vanished, after a short possession, all the exclusive commercial privileges relative to that country, for which the Scots had annihilated

[20] D. Macpherson, *op. Cit.*, III, pp. 573, 583.

[21] P.R.O., returns of the Inspector General of Customs and Excise in Scotland. These, and other trade figures given below from the same source, are officially estimated values at constant prices, indicating changes in the volume of trade.

[22] John Knox, *A view of the British Empire* (1784), p. lix.

[23] See W. R. Scott, Economic Resiliency, *Econ. Hist. Rev.*, I, pp. 292-3.

[24] A. J. Warden, *op. cit.*, p. 480.

their Parliament and their African and Indian Company, and subjected themselves to excises, taxes, duties and commercial restrictions unknown before the year 1707.'[25] This was a jaundiced contemporary view. Such pessimism is as remote from the facts as a too optimistic claim on the other side, that colonial trade exerted a decisive influence in favour of Scottish economic development. Friends and foes of the Union frequently have one thing in common: they exaggerate the importance of colonial trade in the events leading up to the Union, or in the events leading up to Scottish prosperity, or in both.

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[25] John Knox, *op. cit.*, p. xliii.

Overtime in Engineering

DESPITE much talk of the five-day week in Britain, and despite a fairly widespread popular idea that the British worker has never worked less, hours worked in British industry are still about the same as pre-war. The Ministry of Labour's enquiry into hours of work in British industry shows that, for all workers, average hours actually worked were 46·5 in October 1938 and 46·5 in April 1954. The hours worked by adult men were higher in April 1954 (48·3) than in October

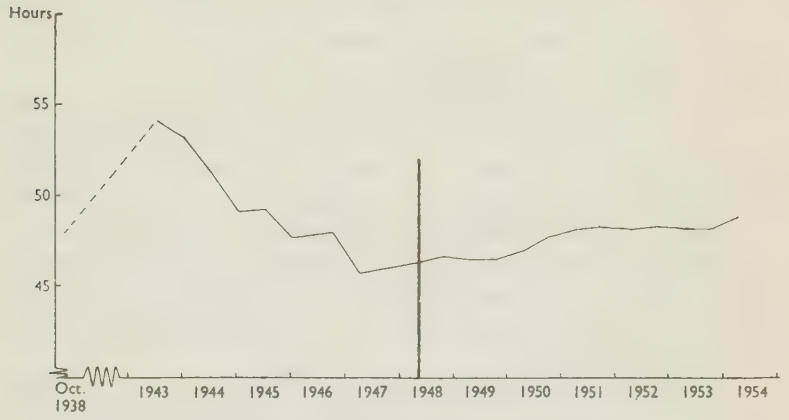

FIG. 1. Hours worked in engineering in 1938 and 1943-54.

1938 (47·7); such reductions in hours as there have been have affected the women (April 1954, 42·0; October 1938, 43·5) and juveniles (boys: April 1954, 44·7; October 1938, 43·5) rather than men.

Since standard hours have been reduced, average overtime hours must have risen. In the broad group of the engineering industries, standard hours per week have generally been reduced from 47 to 44. Fig. 1 shows that for men in this group of industries, hours worked are now higher on the average than in 1938, and have been showing a tendency to increase after the immediate post-war period. This must mean that overtime is common among men working in engineering factories. The hours of women and boys in this group of industries, however, have declined since 1938.

These results require to be reconciled with the Ministry of Labour's overtime enquiry results. In February 1954, in a rather more narrowly

defined group of engineering and electrical industries, between 35 and 40 per cent. of operatives were on overtime with an average number of overtime hours worked of 8½. However, these figures are from a total which includes women and juveniles, who in the aggregate probably amounted to over a quarter of the operatives covered. It would seem that more than half the men in this group of industries were working overtime in the first part of 1954. For the engineering industries as a whole, the average number of hours worked by men was 48·9, so that the average amount of overtime that they worked was probably about 5 hours; and if those men who did no overtime were excluded, this average would be nearer 10.

Hours worked differ a little from section to section of the engineering trades. In marine engineering, for example, hours worked per man average about 1 hour less than in 1938, while in constructional engineering, hours are up on the average by over 1 hour, and in shipbuilding and ship-repairing by about 4.

How do these hours compare with those of other industrial countries? In Western Germany in February 1954 men in the metal-working industries averaged 49·4 hours work a week. Hours worked in mechanical engineering, which is included in this group of industries, were 49·9, and in shipbuilding, 51·8. In general, hours worked seem to be much the same for men as in Great Britain. This is not true for women, however: in Germany, women's hours are much closer to those of men, and average hours for women in the metal-working group in February 1954 were 47·1.

The hours worked in both Britain and Germany are much longer than those in the U.S.A. The figures there are for 'all workers,' but presumably there is relatively little difference between men's and women's hours. In April 1954 in the 'fabricated metal production' group, hours in the U.S.A. averaged 40·1; in 'machinery' they were 40·5; and in 'shipbuilding and ship repairing' they were 38·8.

Factory-building in the Development Areas

The Board of Trade have recently revised the series which they publish for new factories and extensions to existing factories. The new figures are now confined to manufacturing industries only and are given in terms of square feet instead of by value. The revised series confirm the general impression that new factory-building has fallen off in the Development Areas and is increasing in other parts of the country, particularly in the London and Midlands areas. In the early post-war years, over half the new factories in Great Britain were in the Development Areas but the ratio in the past few years has averaged less than one-quarter and in the first half of 1954 had

fallen to just over one-fifth (see Fig. 2). At the end of September 1954, only 21·5 per cent. of British factories under construction were in the Development Areas.

In contrast to the Development Areas, what has sometimes been called ' Inner Britain ' has had an increasing share of factory-building. The area of factories built since the war has been about the same in

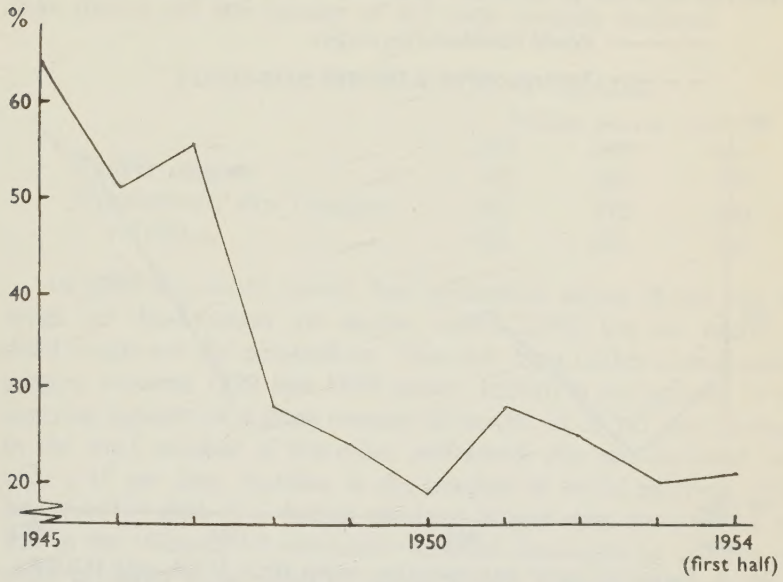

FIG. 2. Proportion of factory buildings started in the Development Areas of Great Britain, 1945-54.

the London and South-Eastern region as in the Scottish Development Area; but the factory space now under construction is about five times as great. The area of factories built in the Midlands region has been about the same as in Scotland as a whole; but the area now being built is well over twice as great. These comparisons are equally applicable to Wales and the South Wales Development Area, the only significant difference between the Scottish and Welsh figures being the rather larger proportion of factory space built in Scotland that lies outside the Development Area.

It is too early to say whether the shift away from the Development Areas will continue or whether the present proportions will be maintained. Since there are roughly twice as many insured workers in the London region as in Scotland and about the same number in the Midlands as in Scotland, it is obvious that new factory-building per insured worker in Scotland is now a good deal lower than in London

and the Midlands. On the other hand, Wales, where there are only about half as many insured workers as in Scotland, compares quite favourably with other regions in the amount of factory space that is being built per insured worker employed there. It goes without saying also that the present proportions are much more favourable to industrial development in Scotland (and in the Development Areas generally) than the proportions of the inter-war years.

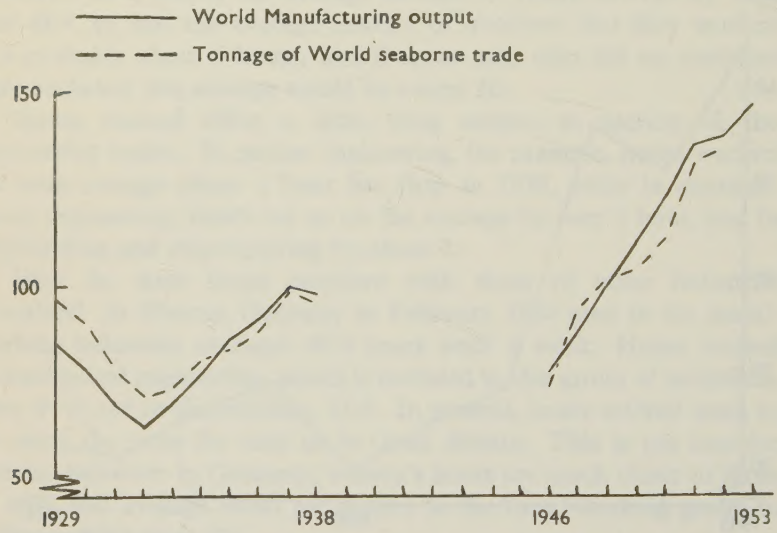

FIG. 3. Indices of world manufacturing output (excl. U.S.A. and U.S.S.R.) and the tonnage of world seaborne external trade. 1937 = 100.

The Demand for Shipping

In examining the long run demand for shipping space it is not always realised how close a connection there has been in the past between world manufacturing output and the weight of goods moving by sea in international trade. Recent figures of the utilisation of the world merchant fleet published by the United Nations Statistical Office make it possible to portray this relationship in graphical form (see Fig. 3).[1]

The movements of the two indices do not correspond at all points of time, but the shape of the curves is very similar and over a period

[1] Figures of the tonnage of world sea-borne trade are given in the U.N. *Monthly Bulletin of Statistics*, January 1954, page xvii. The index of manufacturing production for pre-war years is taken from W. A. Lewis, 'World Production, Prices and Trade 1870-1960'. *The Manchester School*, May 1952, Table 1, and is based on the figures given in 'Industrialisation and Foreign Trade', Annex A. It excludes the U.S.A. and the U.S.S.R. Post-war figures of manufacturing production were published in the U.N. *Monthly Bulletin of Statistics*, April 1954, page xv.

of several years they have tended to keep closely in step. At first sight, this suggests that if world manufacturing production continues to expand so will the weight of goods to be moved by sea. There is need for caution, however, in interpreting the relationship, for the composition of the goods moving in international trade has changed markedly. Between 1929 and 1950, the latest date for which the United Nations have published detailed figures, tanker cargoes more than trebled but the tonnage of dry cargo actually declined.

TONNAGE OF SEA-BORNE TRADE [2]

	Million metric tons		
	1929	*1937*	*1950*
Tanker cargoes . . .	65	105	230
Non-tanker (' dry ') cargoes	390	375	300
Total	455	480	530

In 1950 the world tanker fleet performed about 38,000 ton sea miles per dead weight ton against about 22,000 ton sea miles per dead weight ton for non-tankers. The shift from tanker to non-tanker cargoes between 1929 and 1950 meant, therefore, an increase in the carrying capacity of a given tonnage of vessels. A 20 per cent. increase in the total number of ton-miles performed was accomplished with only a 10 per cent. increase in the tonnage of world shipping. This happened in spite of a decline of about 20 per cent. since before the war in the efficiency of non-tanker tonnage (measured by relating ton miles of cargo to an index of cargo-moving capacity); the efficiency of tanker tonnage was about the same in 1950 as it was in 1929 and 1937. Had the efficiency of non-tanker tonnage been maintained, about 9 m. tons dead weight of shipping could have been released from service in 1950.

It is thus extremely difficult to relate the trend of manufacturing production to the demand for ships; a continued increase in production and the tonnage of goods moved by sea would be compatible with a fall in the demand for ships if a switch from tanker to non-tanker cargoes occurred simultaneously; and an increase in efficiency of the fleet could easily give rise to redundancy.

[2] These figures and subsequent figures in the text are taken from U.N *Monthly Bulletin of Statistics*, September 1954, pages xii-xiv.

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